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For many years clinicians have observed that nervous disturbances play some part in the life-history of patients with chronic peptic ulcer. Hurst and Ryle in this country, and Alvarez, Rivers, and Draper in America have drawn attention to this association. But we have never readily accepted the idea of Rokitansky (1849) that gastric changes may be local manifestations of a disturbed nervous system, though we are prepared to admit that dyspepsia in a nervous woman, showing no organic structural change, may be solely of nervous origin; our training makes us reluctant to believe that disturbance in the nervous system is capable of producing structural change in an organ apparently so remote as the stomach.

The furthest point of agreement in this direction is the belief that men and women of a definite constitutional type, the distinctive features of which are already well-recognised, are prone to develop ulcer. There is also general agreement on the following facts: that peptic ulcer is a common form of dyspepsia; that the lesser curve of the stomach and the first part of the duodenum are by far the most common sites; that the ulcer is situated only where there is active HCl and that its presence depends essentially on an active secretion of HCl; that it is a recurrent disorder in which the ulcer heals only to break down again and that it seldom becomes malignant.

Certain clinical and experimental findings tend to support a neurogenic origin. Peptic ulcer is on the increase; it is common in cities and highly civilised communities; it is found in the young and vigorous and mainly in those who are dynamic in outlook. The restless active man of spare build and angular features is the typical patient, and as age advances the condition grows rarer. Moreover, Beattie (1932) and Sheehan (1934) and their associates have shown that a peptic ulcer can be produced in animals by stimulating the hypothalamic region, and Cushing (1932) has demonstrated the nervous connexions between the irritative lesions in the brain-stem and the local erosions in the stomach which may bleed or perforate.

For some years past we have been impressed with the frequency with which external events have preceded the symptoms of peptic ulcer (Davies 1936), and this paper records an attempt we have made to ascertain what proportion of a large series of unselected ulcer patients experienced some disturbance in their lives before the onset of symptoms; and in those who had recurrences, the proportion of like disturbances which preceded these. We also studied the individual's reaction to his work and environment. As a control series we collected 100 cases of hernia—a "mechanical" disorder unrelated to emotional disturbance—matched as to age and sex and of the same class and drawn from the same sources as the ulcer patients.

Our observations were made on 205 ulcer patients under our personal care. The onset of dyspepsia, the date of its recurrence, and the time of any event of disturbing significance in the life of the patient were noted, the method of obtaining the history being worked out on persons of the same class as those to be investigated—30 unemployed men and 60 employees in a large manufacturing concern. We realised the importance of indirect questioning: not only would it be incorrect to ask, "Did anything happen to you just before your indigestion began?" but the information gained would be less likely to be true than that obtained by indirect questioning, for the ulcer patient often fails (and is disinclined) to notice any connexion between a series of events and the attacks of indigestion that follow them. The inquiry into events was made independently (A. T. M. W.), without the clinical data.

For the second object, that of recording "what manner of man" we were dealing with, we adopted a modification of the standards of Culpin (1930) to classify the material into numbered groups. Patients classed as 0 were those who might be described as placid and well adapted to their environment and able to bear any stress well; while the other groups, Classes 1 to 4, depicted, in increasing measure, chronic emotional stress and maladaption. Class 5 was reserved for the frank psychotic and this contained only one, a hernia control.

It must be remembered that figures derived from such standards are arbitrary, and only gross differences between the group under investigation and the controls would be significant. The differences we obtained were so conspicuous in certain directions that we feel little hesitation in their presentation.

THE ONSET OF DYSPEPSIA

In our inquiry we found that the "events" preceding dyspepsia divided themselves into three main categories—changes in work, financial difficulties, and illness or misfortune in a member of the family. Other events were grouped in a fourth division. The details obtained were often highly personal, and it was necessary to tread delicately, for to the patient who comes to hospital for stomach-ache any such probing into his affairs appears unnecessary and a waste of time.

In Table I the records of 205 ulcer patients are analysed in relation to their respective age-groups, and it can be seen that of this total 172 (84 per cent.) gave accounts of some event which preceded the first symptom of dyspepsia. In both males and females financial difficulties accounted for the bigger proportion—65 out of 205 (32 per cent.)—while changes at work accounted for another 63 (30 per cent.). Of those with "positive" findings under twenty-five years, in 48 per cent. of the males and 48 per cent. of the females some change in work preceded the dyspepsia, while over twenty-five years, 43 per cent. of the males and 48 per cent. of the females experienced money troubles before their dyspepsia began.

In these "positive" records the events occurred shortly—commonly 5–6 days—before the onset of the dyspepsia. The higher incidence of illness of another member of the family, usually of the bread-winner, as a precursor in the female, especially between the ages of forty-five and fifty-five, was noteworthy.

In 33 out of the 205 (16 per cent.) no events preceding dyspepsia were discovered and these are classed as "negatives."

TABLE I—AGE AT ONSET OF SYMPTOMS, AND TYPE OF "RELATED EVENTS" (10-YEAR GROUPS)

Males

Age.	Work.	Money.	Illness.	Other.	Negative.	Total.
Under 15 ..	4	0	1	0	1	6
15–25 ..	17	8	3	4	6	*38*
25–35 ..	7	12	0	2	7	28
35–45 ..	6	9	3	0	2	20
45–55 ..	4	5	2	0	4	15
Over 55 ..	0	4	2	0	0	6
—	38	38	11	6	20	113

Females

Under 15 ..	1	0	1	1	2	5
15–25 ..	20	6	4	3	4	*37*
25–35 ..	3	6	2	1	1	13
35–45 ..	0	5	2	2	4	13
45–55 ..	0	6	7	2	1	16
Over 55 ..	1	4	1	1	1	8
—	25	27	17	10	13	92

TABLE II—ONSET OF DYSPEPSIA IN RELATION TO "EVENTS"

MEN (113 Cases)

Work Change

First job	4
Senior job	7
New job	14
From Army	11
Loss of use of arm	2
	38

Money Change

Unemployed	9
Short time	4
Marriage	8
Dependent relatives through death or illness	6
Unwanted pregnancy	3
Failing business	4
Stopped professional boxing	2
Bought house	1
Left home to evade police	1
	38

Illness or Other

Severe illness or death of Mother	5
Severe illness or death of Father	2
Severe illness or death of Wife	2
Severe illness or death of Other	2
Left drunk parents	2
Quarrels with wife	1
Wife's menopause—no child	1
Examination failure	1
Bombing exploit	1
	17

WOMEN (92 Cases)

Work Change

First job	6
Senior job	8
New job	11
	25

Money Change

Unemployment of bread-winner	6
Husband in France or Army	3
Husband left or dead	2
Short time	1
Family contributions down	7
Unwanted pregnancy	4*
Marriage	3
Business failing	1
	27

* 2 illegit.

Illness or Other

Illness or death of Mother	5
Illness or death of Father	1
Illness or death of Sister	1
Illness or death of Children	3
Menopause	3
Family quarrel	2
Ran away from home	2
Ran away	1
Fire	1
Discovery of daughter's sexuality	1
Husband insane	1
Husband unfaithful	1
Diagnosis of cancer	1
Diagnosis of syphilis	1
Illegitimate child	1
Unwanted pregnancy	2
	27

Table II gives the various events in more detail. The events are similar in women and here again work and money play prominent and often overlapping parts. Some of the stories extracted are almost incredible in demonstrating the real hardness of life to some of these patients; thus one man began to suffer dyspepsia when he found he was unable to repay an agreed 2*s.* per week to his firm towards money borrowed from them to prepare for the coming child.

Three obvious points are demonstrated by these tables. First, the events are real and not imaginary. Secondly, they are largely concerned with responsibility, security, and independence. Thirdly, the most frequent is some change of job—often a more responsible post—in persons under twenty-five, whereas over twenty-five income changes predominate. Sexual problems are conspicuous by their relative absence and are only present when they relate to income and expenditure.

We interrogated the hernia series in the same fashion, and found that in a certain proportion there was an event which preceded or coincided with the "onset" of the hernia—but this proportion (22 per cent.) is in marked contrast to the figure (84 per cent.) obtained on similar lines in ulcer (Table III).

TABLE III—"EVENTS" COINCIDING WITH "ONSET" OF HERNIA (CONTROLS)

Males

Age.	Work.	Money.	Illness.	Other.	Negative.	Total.
Under 15 ..	0	0	1	0	1	2
15–25 ..	1	0	0	0	11	12
25–35 ..	1	2	0	0	17	20
35–45 ..	3	1	3	0	21	28
45–55 ..	0	1	0	0	6	7
Over 55 ..	0	0	1	0	5	6
—	5	4	5	0	*61*	75

Females

Under 15 ..	0	0	0	0	3	3
15–25 ..	0	0	0	0	2	2
25–35 ..	2	0	1	0	3	6
35–45 ..	1	0	0	0	1	2
45–55 ..	2	0	1	0	6	9
Over 55 ..	1	0	0	0	2	3
—	6	0	2	0	17	25
Totals ..	11	4	7	0	78	100

Too much stress need not be laid on the ulcer cases in which no preceding event was found—16 per cent. is not an unduly high figure to allow for poor memory and unwillingness to reopen old wounds. The disturbing change is not always in the environment but may be in the person himself, as a result, for example, of the growing physical difficulties of old age. This is especially true of the manual labourer, who finds himself at sixty or over unable to do what he used to do without effort.

The points we have noted are best shown in a few of the case-histories.

CASE 1.—A woman of 57 with a five weeks' history of dyspepsia which she had never had before. She showed an enormous ulcer crater on the lesser curve of the stomach (Fig. 1), so large that we doubted its benign origin. The ulcer healed under treatment, she gained weight, and has remained free of all symptoms since with no signs of recurrence on radiography. Her story is as follows: "I wasn't well in myself for some time before I had the pain, not eating either. I began to notice the stairs a bit more—my kitchen's downstairs and I've two sons and a husband

to look after besides my great-aunt. She'd been with us about a year at the time. She's elderly now but not a lot of work really. She's not bed-ridden of course. I've managed to keep going and do all my own housework. The pain was very severe five days before I came to hospital. It was then (that day) we knew for certain that my great-aunt couldn't pay us any longer. I'd been wondering about it for some time." This was in March, 1934.

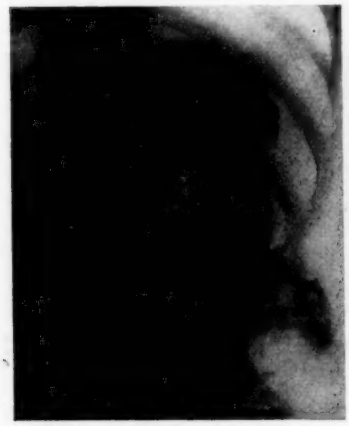

FIG. 1 (Case 1).—Large ulcer crater on the lesser curve in a woman of 57 with a five weeks' history. (The radiogram was taken with the patient prone, and the lower part of the stomach is not filled.)

If mental stress is of significance in the production of chronic peptic ulcer it follows that a person who has a well-marked ulcer crater and an equally well-defined short history with perfect digestion before and after the attack of dyspepsia should show an equally clear-cut period of mental stress preceding the symptoms, and the upset should have occurred in the patient's life on this one occasion only. The two following cases are of this kind :—

CASE 2.—A woman of 39 with dyspepsia of two months' duration; she had never had indigestion before. Her stools were black and her hæmoglobin was 48 per cent. Radiograms showed a large lesser curve ulcer (Fig. 2A). Treatment dispelled symptoms, and the crater disappeared in two months (Fig. 2B); it has never recurred. Her story was: "One night in October (1931) as I was by myself at home just going to put the children (age 11 and 9) to bed, I smelt smoke and went upstairs. I went into the room to open the window but it was full of smoke. I had to come out and collapsed on the landing. The next morning I felt very queer and my tummy was topsy-turvy. I became terribly nervy and could not stop brooding over the fire. I brought up wind all the time. In a few days I had a feeling of a lump in the bottom of my chest, which drove me to the doctor and he eventually sent me here (January, 1932). We were insured over the fire but it upset my nerves all the same."

CASE 3.—A man of 29 first attended in April, 1935, with a six months' history of dyspepsia. He showed a large ulcer crater on the lesser curve of the stomach. Treatment was commenced but after a few attendances he disappeared.

His own story of this is as follows: "I lost the use of my arm in 1930. It was in 1932 I took on the shop and I got married in February, 1933. We just took chances about having a baby but it upset me a bit when I knew my wife was pregnant (September, 1934). It was some weeks afterwards that the pain started. The shop was not in a good state then—it's a general store. I run it myself. It's open from 7 in the morning until 9.30 at night, and seven days a week. I took it in a bad state hoping to make something of it. I get a living out of it now (1937) but it's taken me five years to do it."

His first appearance with us was at a time his wife was seven months' pregnant. Apparently he did fairly well for his absence after one or two visits suggests a remission had set in.

His second appearance was in December, 1935, when his condition was obviously serious. He was very pale and had for two days vomited dark blood. He was admitted to the wards with a hæmoglobin of 40 per cent. and a large ulcer was again demonstrable on the lesser curve. A gastric analysis showed a prolonged hypersecretion and hyperacidity. During three months in hospital there was a rise in the hæmoglobin to 76 per cent. and complete disappearance of the ulcer crater; his weight rose from 8 st. 11 lb. to 10 st. 4 lb.

This is his history: "In November (1935) baby was 5 months old at that time and I'd had to take a lot of time from the shop to look after it. My wife's feet got swollen and she'd pain in her back. She's attending hospital now with it. I had a private doctor for the confinement. My business is all credit and I've got to get money in or I can't go on. I'm not insured either, and the confinement cost me a lot too. I got a summons at that time for selling things out of hours. They fined me 15*s*."

After his discharge from hospital he attended the clinic regularly and complained of no symptoms. Repeated X ray examinations were also negative. In April, 1937, he complained of a return of symptoms and radiography ten days later showed a lesser-curve ulcer. On his way home after the X ray examination he vomited blood and he was again admitted to hospital. Again he gives a similar story. "They caught me again, selling a pound of sugar on a Thursday afternoon. That's what brought it on. I took no notice of the summons really, but things go wrong inside you and you get morbid—can't give your mind to anything. The pain was a day or so coming on, but it's not the pain, you get used to that. I was in hospital when the summons was due, so it had to be postponed."

If a person had no indigestion until the age of 60, and environment plays any part, we should find some stirring event or misfortune which has not been previously experienced. Here is an example.

CASE 4.—A woman of 65, previously in good health, with indigestion of twelve months' duration, increasing in severity and frequency during the preceding three months. Radiological examination showed a duodenal ulcer.

This patient had lived happily with her husband and three children, mainly abroad. Her children are now married and live abroad. The husband and wife returned to England three years ago. Suddenly the husband left for the Continent with another woman. The patient's grief is coupled with an intense anxiety over her future means of support, since she depends on a monthly allowance which comes without information and which may cease at any time. She has no money in reserve and is 65. Indigestion began after the departure of the husband.

A B

10.ii.33 24.v.33

FIG. 2 (Case 2).—Lesser-curve ulcer in a woman of 39 with a two months' history. Healed on three months' treatment.

A person who has enjoyed security in business may suddenly be plunged into an anxiety of uncertainty, and if dyspepsia follows closely on this anxiety it must be regarded as of some significance.

CASE 5.—A butcher, aged 53, showed a well-marked duodenal ulcer in March, 1935, and had suffered from dyspepsia for the preceding three months. The event which preceded his dyspepsia is best given in his own words: "In the beginning of January, 1935," he said, "I looked out of the window of my shop one day and right opposite me was opposition. Some of my trade went away and it was hard to see it go. But I kept on and it all came back again. They closed down in six months!"

The patient made an excellent response to treatment and there has been no recurrence during the past two years. One isolated event which threatened his very living was followed by dyspepsia and the signs of duodenal ulcer.

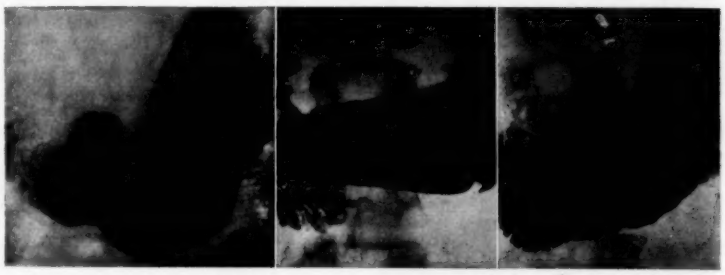

FIG. 3 (Case 6).—In October, 1935, the patient had signs of a duodenal ulcer but no signs of a gastric ulcer (A). A lesser-curve ulcer developed at a time of emotional stress in the first month of treatment (B), but had disappeared in three weeks.

These five cases have a common factor in some some unusual occurrence which threatened the even tenor of their lives. Three of the patients were over fifty—a time of life when security is the more valued since resource, adaptability, and strength are beginning to fail.

RECURRENCES AND RELATED "EVENTS"

In addition to recording the presence or absence of some external event before the onset of the dyspepsia, close inquiry was made into subsequent "events" and their relation to any return of gastric symptoms. If a number of ulcer patients are followed for any length of time it is soon realised that though relapses are frequent actual recurrent ulcer craters are far less common. There is probably little difference in the mechanism involved, the ulcer crater being no more than a further stage in one process, but we have included only those relapses in which an actual recurrent ulcer crater was again demonstrable, after definite proof that the original ulcer had healed. With such criteria we can survey 33 cases, some of which showed more than one recurrence.

Usually a patient is more ready to attribute his return of symptoms to some article of food than to a recent stress. The onset of the symptoms is usually some 3–5 days after an "event," and when he comes for treatment a week or two later his attention is engaged on his digestion and on the relief expected; indeed, he may be amused at the thought that the external event and the internal pain possess any connexion.

These 33 people had 52 recurrences within five years. In 10 of the recurrences no event affecting their work, finance, or family could be found associated with the return of symptoms, but in 42 (85 per cent.) there had been some such disturbing event.

TABLE IV—RECURRENCES AND RELATED EVENTS

No of Patients .. 33 Recurrences .. 52

Events.	Work.	Money.	Illness.	Negative.
Men	11	10	4	6
Women ..	0	8	9	4
Total ..	11	18	13	10

This high percentage (Table IV) again suggests that these events are not accidental but probably of fundamental significance. It will be seen that 11 recurrences were associated with some change or stoppage of work, 18 were connected with money difficulties, and 13 with some illness of another member of the family, while in 10 no story of any such event was obtainable.

Here are some examples:—

CASE 6.—An engineer of 51 complained of dyspepsia of some ten years' standing. The attacks were periodic with six-month intervals of freedom. The signs of a chronic duodenal ulcer were well-marked. Treatment

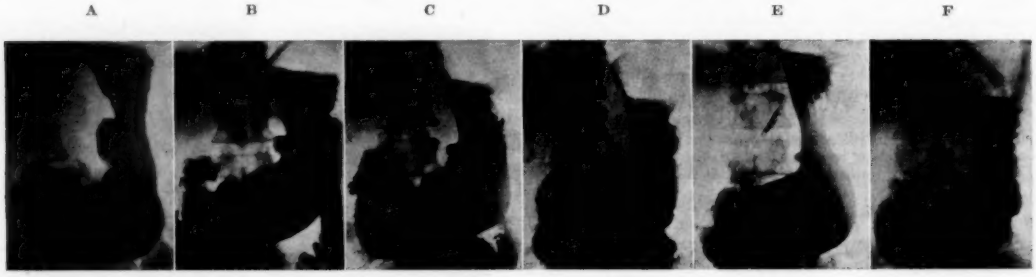

FIG. 4 (Case 12).—Radiograms showing continuous improvement (A–D) followed by relapse (E), coincident with emotional stress, and finally by disappearance of crater (F). The shadow shown in (F) a little below the site of the former ulcer is jejunum.

was begun, the patient remaining at work, and after a month he was free of pain. A month later a barium meal showed the duodenal ulcer crater to be still present, but the patient had no symptoms. In the fourth month of treatment a routine barium meal showed a well-marked lesser curve ulcer in addition to the duodenal lesion (Fig. 3 A–C). Questioning elicited that this new finding followed an important event in the patient's life. Seven days previously the patient while reading the *Financial Times* had been astonished to find a notice of the amalgamation of his firm with a larger concern. As he had represented his own (and smaller) firm for twenty years and had not been informed of this important fusion he came to the conclusion that he was for the "high jump" and that as he was now over fifty he would soon be without any means of support. He returned to his home to brood over the serious news the whole of the week-end. The thought that his two daughters' education would suffer caused him much concern. Three days later his pain had returned and it persisted for another four days until the day of his barium meal when he had a letter from his director expressing regret at the premature announcement and assuring him that he among three others would remain in the same capacity in the new firm as in the old. It was on this day that the barium meal showed a lesser-curve ulcer, and it was on this day that he lost his pain. Three weeks later another barium meal showed no sign of the lesser-curve ulcer, and he has since enjoyed freedom from all symptoms.

CASE 7.—A woman of 31 who had always suffered from indigestion, which had been much worse during the period 1929–31, the brief lifetime of her only child, an imbecile. In 1931 her gall-bladder was removed and stones were found, but her dyspepsia returned. In 1933 X ray examination showed a stomach of poor tone and some delay in emptying. No crater was then demonstrable. Treatment was followed by some improvement and she gained weight. Symptoms were in abeyance until April, 1935, when she complained of indigestion, and radiography showed a duodenal ulcer crater. The indigestion had come on a few days after her husband had met with an accident at work. Symptoms again abated and a further radiogram in August, 1935, showed no ulcer crater. She remained well until October of the same year when her symptoms returned a week after the sudden death of her brother, the ulcer crater being again demonstrable in November. The patient has since remained well and no ulcer crater has since been demonstrated.

CASE 8.—In October, 1932, an unmarried man of 28, living with his parents, complained of severe dyspepsia of six weeks' duration. A large ulcer crater was demonstrable on the lesser curve, which disappeared in six weeks. The symptoms came on a fortnight after taking up a new appointment out of London—which necessitated his living away from home. This patient has been observed closely since 1932, and five recurrences have been clearly demonstrated. In three of them the symptoms started within a fortnight of leaving home to take on a new appointment; in the fourth they followed a heated discussion at home over his mode of living, and in the fifth no related event was elicited.

CASE 9.—A labourer of 37, with five children, complained in July, 1933, of seven weeks' dyspepsia. His indigestion had really begun in the summer of 1931 when his wife had become ill after the discovery on awaking one morning that the baby which had been asleep in her arms was dead. His wife's illness depleted his financial resources. A new baby had just been born, and his main anxiety when he first attended us was whether there would be a repetition of these events—a dead baby, the illness of the wife, and financial embarrassment. He had a large ulcer crater on the lesser curve of the stomach By September, 1933, this had disappeared and he had lost all symptoms. There was a return of symptoms in January, 1937, after an accident to his eldest boy, but on X ray examination no ulcer was seen. At the end of April, however, when there was a further recurrence, a well-marked ulcer crater was demonstrable. This followed a further breakdown in his wife's health. He was admitted to hospital and in June, 1937, the ulcer had healed.

This case shows a close relationship between the peaks of domestic stress and the development of ulcer. "It's when I'm upset," he said, "that it comes on."

Similar events appear to precede symptoms in patients who have been operated on.

CASE 10.—A married man of 50 had periodic dyspepsia for some years and in 1928 a gastro enterostomy was performed for "gastric ulcer." He was free of symptoms until the autumn of 1934, when they returned. This occurred after his wife was in hospital for an operation and he had to do a very hard day's work and the housework as well. From 6 A.M. till midnight he was anxiously occupied. After five days' dyspepsia he had a hæmatemesis at work, and X ray examination showed a jejunal ulcer. This healed well. In May, 1936, a small lesser-curve ulcer appeared, not following any ascertainable event, and healed in two months. His freedom from symptoms for the last 18 months has coincided with "peace" at home.

CASE 11.—A married woman of 30 with two children. In April, 1935, she gave a history of dyspepsia of eighteen months' duration. Her mother had died when she was 20, and she had been largely responsible for care of her 5 younger brothers and sisters. An X ray examination showed a well-marked duodenal ulcer. In two months this had disappeared and she was symptomless. In January, 1936, there was a recurrence of symptoms but radiography showed no return of the crater. She was then free from symptoms until September (1936) when she had severe pain and vomiting. An X ray examination showed all the signs of an active duodenal ulcer. Seven days before this recurrence one of her two children was "rushed to hospital" with appendicitis, and the other "broke her arm" in an accident. Radiography in December, 1936, showed no crater and the subsequent history has been without event.

In this patient, who has been under fairly constant observation since April, 1935, the only radiological recurrence was preceded by an acute anxiety engendered by the admission of her two children to hospital.

CASE 12.—A married man aged 40. He became a bus driver in 1922 on his discharge from the army and his indigestion began at that time, but the attacks were infrequent and soon relieved by medicine. His symptoms were worse in May, 1936, with the new summer schedules and the "speed up" of buses. Insomnia was troublesome and the pain was severe at night. When he came to our clinic in August, 1936, he weighed 8 st., and radiography showed a large ulcer crater on the lesser curve of the stomach (Fig. 4A). He was admitted to hospital, his symptoms disappeared, and weekly radiological examinations showed progressive diminution in the size of the crater (Fig. 4A–D). In the 6th week (Fig. 4D) the ulcer was a mere tented projection, but a return of symptoms was complained of and in the 7th week the ulcer crater increased in size (Fig. 4E). It appeared that this unexpected exacerbation had followed a visit from his wife, who had told him that he seemed fit enough to be at home, and a remark by another patient that ulcers often turned to cancer, and that the repeated examinations were "because they don't know what's wrong with you." With reassurance his symptoms disappeared and his ulcer had healed by the 10th week (Fig. 4F), since when he has remained well.

These last seven examples demonstrate the relation of a recurrence to anxiety. The uncertainty of a living, the anxiety engendered by the accident to the breadwinner, the departure from home, the illness of the wife and its financial difficulty, the anxiety of the mother about her two children, are real everyday occurrences. Coinciding with or following these events new ulcer craters were demonstrable in stomachs already proved free of ulcer.

THE ULCER TYPE

It is not enough to show that symptoms of ulcer are often preceded by emotional disturbances, for

these events are common to all living people, whereas severe dyspepsia is found in relatively few. The seed must be implanted in the soil. Can we assume that the ulcer patient is of distinct type or frame? Attempts to answer this question have been made by Hurst and Ryle in this country, Alexander, Rivers, Draper, Emery, and Munro in America, and von Bergmann in Germany. Clinical work with peptic ulcer patients leads inevitably to the conclusion that there is a predominant type whose outstanding characteristics are to be found in their facial expression, their intense mental and physical activity, and their reaction to illness.

In both men and women the long thin face, the sharpened nose, the angular jaw, the absence of spare fat, and the deep lines from alæ nasi to the angles of the mouth make together a typical facies. There is also a rather aggressive alertness and readiness to tackle any job or problem—"an alert watchful expression which conveys a suggestion of continual apprehension mixed with defiance" (Draper and Touraine 1932). A serene contented facies is never seen.

Another significant feature of those of the ulcer type is their weight. An ulcer patient seldom weighs as much as 13 st. Even men, when symptoms are present, often weigh only 9 st. This again points to that ceaseless energy and restlessness, which has been described by Culpin as "drive." Robinson (1935) aptly said that the ulcer patients are always in the front line of life's activities. They display enthusiasm at any project in hand, and execute their task with zeal and sometimes with intense excitability. They also show pride in their labours and an equal disappointment and anxiety when they fail in whatever they attempt. Through their keenness they expose themselves to affronts, failures, and disappointments more frequently than their placid neighbours. Some of these characteristics seem capable of rough numerical assessment, and hence of comparison with a matched group of average people. For this comparison we have used the hernia patients, previously used as controls.

To assess the whole man as an individual is difficult, and it is still more difficult to record this assessment. We have adopted for this purpose Culpin's system of group scoring (Culpin 1935)—in our opinion the most practical method. In assessing the emotional status, inquiry was made into work, hobbies, and mode of life. The relationship of interest to activity, and the limitation of interest by other factors were closely observed.

The first field of investigation is the presence or absence in any sphere of interest of fears or anxieties which are unreasonable in nature or degree. For instance one man described how he was forced to refuse a good job as a salesman because he knew he could not be at ease with people; another that he has always avoided crowds because he becomes panic-stricken in them.

The second main field of inquiry was that of needless activities—unavoidable repetition of tasks or duties, inability to rest—a common form of disguised anxiety—and abnormally fixed habits of life with unusual degrees of anger or anxiety when these habits are forcibly changed. Thirdly, inquiry was made as to the frequency and nature of swings of mood. The commonest symptom of current anxiety is what patients describe as "good and bad days," passing morning depressions, often with headache. These work off during the day and appear and disappear quite unreasonably from one day to another.

The ulcer patients and the control group of hernias were divided by this assessment into five sub-groups (Table V). Class 0 represents those in whom no sign or symptom of the kinds described was detected, while Classes 1–4 represent the increasing presence of signs of emotional stress. In Classes 1 and 2 these may be described as "character traits," but they must be regarded and described as "symptoms" (or signs) when they reach the extent and degree found in Classes 3 and 4. The figures for hernias obtained by this assessment agree with similar estimates made by other workers on samples of the general population.

TABLE V—CULPIN SCORES IN ULCER AND IN HERNIA

75 Men

Class	*0*	*1*	*2*	*3*	*4*	*5*
Hernia	6	28	34	4	2	1
Ulcer	0	1	17	42	15	0
	Hernia		90%	10%		
	Ulcer		24%	76%		

25 Women

Class	*0*	*1*	*2*	*3*	*4*	*5*
Hernia	0	9	8	7	1	0
Ulcer	0	0	4	10	11	0
	Hernia		68%	32%		
	Ulcer		16%	84%		

Total, 100 cases

Class	*0*	*1*	*2*	*3*	*4*	*5*
Hernia	6	37	42	11	3	1
Ulcer	0	1	21	52	26	0
	Hernia		85%	15%		
	Ulcer		22%	78%		

A special age-matched sample of 100 patients with ulcer and 100 with hernia was collected and scored as we have just described. Of each group 75 were males and 25 females. The Table shows that there is a significant excess of the higher scores in ulcer as against hernia, strongly suggesting that the ulcer patient is drawn from a group of the population which can be separated from the average man.

The majority of ulcer patients certainly differ from the majority of hernia patients in the degree to which tension is a constant characteristic. The ulcer patient is first and foremost a worker; and a large number will readily describe how they have difficulty in giving up work. Further there is an urgent, anxious, and compulsive quality in their activity, and if they are not working they are worrying. By specific inquiry we found that patients whose compulsive activities were sufficiently obvious to be a common source of caustic or congratulatory comment by friends or relatives, showed a sufficient excess in ulcer over hernia to suggest that this characteristic is a not uncommon feature of ulcer. In 75 male ulcers 40 were so classified; in the corresponding group of 75 male hernias there were 9. In 25 women with ulcer 18 had this characteristic, while in the female hernias there were 5. Of the 100 ulcer patients, therefore, 58 show this characteristic as against 14 of the 100 hernias.

There can be no doubt that these figures are of importance. They demonstrate that the sharpness and aliveness of the ulcer patient depends to some extent on a constant tension which is a valuable character trait in its minor forms, but carries with it various penalties when it becomes more severe. Their intense interest in activity and efficiency seems likely to be related to their strange failure to recognise the relation of external stress to their dyspepsia. It is also related to their tendency to continue working despite dyspepsia, unlike others

in whom slight physical disorder readily results in relief from toil.

DISCUSSION

Writing on duodenal ulcer in 1932 Ryle aptly stated that "our method will find its basis quite as much in intimate studies of constitution, habits of life and environment, as in the refinements of chemistry bacteriology and animal experiment." As long ago as 1884 Stiller pointed out the relationship between gastric upsets and financial losses, and there is good ground to believe with Barclay (1932) that the stomach is one of the most responsive organs in the body, for "we know that it may react to almost every emotion and sensation that man is capable of experiencing."

Our investigations suggest that the ulcer individual is more liable to rebuffs and failures than his less ambitious, less active brother. Yet he is able to pass through life happily until some acute stress or anxiety is suddenly experienced, when he is liable to discharge his increased tension via special channels of his autonomic nervous system. He is reticent and does not wish to unfold his difficulties—the layman sometimes calls this "feeling things inwardly"—and it may be this that is so damaging to him. In most of our patients the anxiety that preceded dyspepsia was related to security—money difficulties, increased responsibility at work, the possibility of dismissal, the illness of a near relation, the sudden death of a brother. Dyspepsia appears some 5–7 days after such events, and, as we have shown, is soon followed by a demonstrable ulcer crater.

Many are worried but few develop dyspepsia. There is no complete explanation why. But we know from experience that ulcer heals readily; we also know that frequent feeds and occasional administration of alkali soon dispel the early symptoms; and it may be that ulcer in its early stages is more common that we imagine. In the ulcer individual there is the soil and the seed. The soil is the tense, active personality whose concern is more with things external than with his own health; the seed is acute anxiety the result of some reverse in fortune or increased responsibility. He begins to suffer from dyspepsia, or rather hunger pains, and if he eats regularly and frequently, he may quickly obtain relief. Or he may be engrossed in his work (perhaps more than usual because of his anxiety), and be long hours without food, in which case there is a pouring forth of active juice undiluted by food, and an ulcer forms. With attention to frequent feeds and medication the ulcer heals and the symptoms disappear. He goes his way and remains well, able to eat and drink what he will, with no pain or discomfort, until another upset brings a return of his symptoms, and with it all the signs of an active ulcer. Such are our examples, some of them in people in whom complete freedom from dyspepsia had been enjoyed for twenty or thirty years until a crisis was suddenly experienced. In some the dyspepsia and ulcer-formation occurred for the first time at the mature age of sixty—but in such cases, as a rule, the event preceding the symptoms was outstanding.

Will such a view fit in with our present knowledge of ulcer? The multiplicity of cures in a way support this nervous origin. None can deny that medical measures dispel ulcer symptoms and signs, or that surgery is also successful, and the injection of histidine or even of sterile water have their advocates. Peptic ulcer is a recurrent disorder; it heals and breaks down again. Even without any treatment the patient often obtains freedom from attacks for (it may be) a year or more. If we believe that an ulcer can be produced by electrical stimulation of the hypothalamus (Beattie, Cushing, and others) we must also be ready to accept that emotional upsets may produce profound disturbances in gastric function and eventually in structure, and it follows that a man's environment, work, and responsibility are of fundamental importance. Attention to the whole man is therefore essential if our therapy is to succeed. It is not enough that the ulcer heals, it must be prevented from recurring. By demonstrating to the patient the connexion between his mind and his stomach much may be accomplished. His anxieties may be lightened by some adjustment of his work, and he may forestall damage to his gastric mucosa by frequent meals and regular habits. There is more in this than is apparent. It is not uncommon to hear from a patient who shows hypersecretion and hyperacidity that he breakfasts at 6 A.M. and has no food whatsoever until 1 P.M., and again is without any sustenance until 5 or 6 P.M. A simple alteration of his habits will do much. Moreover, when the clouds gather and worries accumulate, a rigid régime will do much to prevent recurrences and relapses.

In the development of the clinical peptic ulcer there are probably several factors: the character and frequency of foods, the degree of hypersecretion, as well as the type of person and the type and frequency of emotional upsets. We wish however to emphasise that the mind appears to play an important part and we are inclined to believe that if an ulcer patient is freed from anxiety his dyspepsia troubles him no more.

During our observations we found that relapses—i.e., a return of dyspepsia—were frequent, but only a minority of patients showed on X ray examination a return of the ulcer crater. These relapses were investigated in similar fashion and we found the same history of anxiety preceding the return of indigestion. There appears to be no distinction between these relapses except possibly the magnitude of the disturbance felt and the readiness with which the sufferer resorts to frequent feeds. Though in this paper we have not incorporated any Tables showing relapses without craters we wish to emphasise our belief in their similarity. There is a tendency to treat a person who suffers from indigestion and who shows no ulcer with a certain flippancy, but once he develops an ulcer (although it may be no more than a mucosal fleck) he is considered a different being—a sufferer from an organic disorder as distinct from a functional dyspeptic. This readiness with which we sort the patients into two distinct categories, the organic and the functional, on a breach in the mucous membrane is hardly fair, if we believe that the mind plays an important part in ulcer development. Some very hard but true words were written by Boles in 1928:

> "Unfortunately scientific progress has been so dramatic that the study of the disease overshadows the study of the patient. The student, the surgeon, the clinician of to-day concentrate their endeavours on the search for something organically wrong, and if their best efforts are not rewarded, interest in the patient lags; he is simply labelled a neurotic and ipso facto becomes a candidate for Christian Science or some medical fad."

According to our findings peptic ulcer is in origin a disturbance of the nervous system and deserves no more and no less attention than that form of dyspepsia which at the time of examination shows no demonstrable ulcer crater. Indeed there is much to support the conception that "there is no such thing as a

purely psychic illness or a purely physical one, but only a living event taking place in a living organism" (Mohr 1925).

Our patients' troubles were those of people of small means—men and women who depend for their well-being on the money they earn each week—but we have found no difference in private practice where anxieties may be over matters of larger dimension.

We were surprised to find that the patients failed to observe any connexion between their anxiety and the dyspepsia, although in most cases it was blatantly obvious. But once the sequence of events is understood success in treatment is far more certain. It may be that there is much suppression of their anxiety, and that emotional problems, thus put out of mind, retain their power to cause long-standing tension, dysfunction, and eventual structural changes.

SUMMARY

1. Inquiry into 205 cases of peptic ulcer showed that in 84 per cent. the symptoms began soon after some event affecting the patient's work or finances or the health of his family. Only 22 of a control series of 100 patients with hernia gave a history of any such event preceding their illness.

2. Of 52 relapses of peptic ulcers, proved by radiography, 42 were shown to date from some event causing anxiety to the patient.

3. A group of 100 ulcer patients were compared psychologically with 100 hernia patients using Culpin's system of group-scoring, and it was found that a significant excess of ulcer patients showed undue tension long antedating their ulcer symptoms.

4. A description is given of the characteristics of the ulcer patient—his facies, his constant activity, and his reaction to illness.

5. It is concluded that chronic peptic ulcer is an example of the influence of the mind in producing structural change, and that successful therapy depends upon attention being given to the whole man—his work and his anxieties, as well as his diet.

Part of this work was made possible by a grant to the Tavistock Clinic by donors who desire to remain anonymous. We wish to record our gratitude to the staff of Barnsbury Labour Exchange, and to the directors, staff, and medical officer of Messrs. Horlick's of Slough for their coöperation; to the staff of Hounslow (Middlesex), Richmond Royal, and Wood Green Hospitals for ready access to patients with hernia; to Sir Frederick Menzies and the staff at Lambeth and St. Mary Abbot's Hospitals for further supplies of hernia; and lastly to our colleagues at the Royal Free Hospital for their many kindnesses.

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NEW TRYPANOCIDAL SUBSTANCES

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It has been shown recently by Jancsó and Jancsó (1935), and by Schern and Artagaveytia-Allende (1935, 1936) that Synthalin (decamethylenediguanidine) has a definite therapeutic effect on mice infected with various pathogenic trypanosomes. Apparently both groups of workers were led to make this interesting observation by the same considerations—viz., firstly that trypanosomes require for their metabolism large quantities of carbohydrate, and secondly that synthalin, when given in large doses, produces a pronounced hypoglycæmia. Still more recent investigations, however (Lourie and Yorke 1937), showed that synthalin exerts in vitro a powerful trypanocidal action which is of the same order as that of the aromatic trivalent arsenicals, a concentration of only 1 : 256,000,000 sufficing to destroy practically all the trypanosomes of a suspension within 24 hours at 37° C. From this work it was concluded that the therapeutic action of synthalin does not depend upon any hypoglycæmia which it may produce in the host, but upon its direct lethal effect on the parasite.

Table I

Compound.	Trypanocidal titre in vitro.	Toxicity (M.L.D. in mg. per 20 g. mouse).	Therapeutic effect in infected mice.
Tetramethylene-diguanidine 2 HCl	1,000,000	4·0	Nil.
Pentamethylene-diguanidine 2 HCl	1,000,000	4·0	„
Hexamethylene-diguanidine 2 HCl	8,000,000	1·0	„
Octamethylene-diguanidine 2 HCl	64,000,000	0·25	Slight.*
Decamethylene-diguanidine 2 HCl (synthalin)	256,000,000	0·125–0·25	Cons.†
Dodecamethylene-diguanidine 2 HCl (synthalin B)	256,000,000	0·125	„†
Tetradecamethylene-diguanidine 2 HCl	256,000,000	0·125	„†
Halarsol	256,000,000	0·75	Curative.‡

* *Slight* implies that with maximum tolerated doses the blood of infected mice is cleared of trypanosomes for a number of days, but relapses always occur.
† *Considerable* (cons.) implies that fractional doses suffice to clear the blood temporarily, and that with maximum tolerated doses, or repeated smaller doses, permanent cures are occasionally obtained.
‡ *Curative* implies that cures are usually obtained with single easily tolerated doses, or with repeated small doses.
M.L.D. = minimum lethal dose.

This discovery of the direct trypanocidal action of synthalin is one of considerable interest, because its chemical constitution is essentially different from that of all known trypanocidal substances. In view of this fact it seemed of importance to determine by a series of orientating experiments how far the trypanocidal activity of synthalin is a specific property of the alkylene diguanidine type of molecule.

In the first place a series of homologues of synthalin was prepared and tested. It will be observed

(Table I) that the trypanocidal action in vitro rises as the number of methylene groups in the alkylene chain increases, until, when these number 10 to 14, the action in vitro is comparable with that shown by the aromatic trivalent arsenicals—e.g., Halarsol. With lengthening of the alkylene chain there is also an increase in toxicity for mice, but this increase is not strictly parallel with that of the trypanocidal activity; thus the decamethylene member (synthalin) is 256 times as trypanocidal as the tetramethylene compound, but its toxicity for mice is only 16 to 32 times as great as that of the tetramethylene compound. The therapeutic effect in infected mice is seen to be dependent upon these two factors. With the lower members of the series, which exhibit a relatively low trypanocidal power in vitro, there is no appreciable therapeutic effect; this first becomes manifest with the octamethylene member, maximum tolerated doses of which clear the blood of infected mice for a number of days. With the 10- to 14-methylene members the therapeutic action is considerable; for example, in the case of synthalin 0·05 mg. per 20 g. mouse (about a third of the maximum tolerated dose) sufficed to make the blood negative for 5 or 6 days; and permanent cures were occasionally obtained with the maximum tolerated doses, and also with repeated smaller doses.

TABLE II

Compound.	Titre i.v.*	Toxicity.*	Therap. effect.*
Guanidine carbonate ..	16,000	10·0	Nil.
Nonylguanidine HI	64,000	1·0	"
Dodecylguanidine HCl ..	4,000,000	0·25	"
Tetradecylguanidine HCl ..	4,000,000	0·5	"
Hexadecylguanidine HCl ..	4,000,000	1·0	"
Octadecylguanidine HCl ..	500,000	8·0	"

* The headings shown in Tables II–VIII are contracted from those in Table I.

The alkylguanidines (Table II) also exhibit trypanocidal activity when examined by the in-vitro technique, but of a much lower order than that of the corresponding diguanidines.

TABLE III

Compound.	Titre i.v.	Toxicity.	Therap. effect.
Arginine	1,000	>10·0	Nil.
Agmatine	64,000	>16·0	"
Galegine sulphate	256,000	0·5	"
Hydroxyhydrogalegine ..	16,000	>10·0	"
Glycocyamidine	1,000	>10·0	"
Alacreatinine	<1,000	>10·0	"
Creatinine	1,000	>10·0	"
Diguanylspermine 4 HCl ..	256,000	1·0	"

Certain simple cyclic guanidines of the type of creatinine, and other guanidines containing carboxyl, amino, and hydroxyl groups, display very little trypanocidal action in vitro (Table III). Especially noteworthy is the relatively weak activity shown by diguanylspermine, which differs from synthalin only in that the chain of 10 methylene groups is broken by 2 imino groups.

That the guanidine grouping $NH:C(NH_2)NH-$ is not essential for trypanocidal activity is shown by the result of examination of a series of alkylenedi-isothioureas, in which the connecting link between the guanyl grouping $NH:C(NH_2)-$ and the carbon (alkylene) chain is not an imino group $-NH-$ but a sulphur atom—e.g., $NH:C(NH_2)-S-CH_2-$. Here also the trypanocidal action rises as the series is ascended (Table IV). The only factor common to the two series is the possession of a long carbon chain and the guanyl grouping $NH:C(NH_2)-$.

TABLE IV

Compound.	Titre i.v.	Toxicity.	Therap. effect.
Ethylenedi-isothiourea 2 HBr ..	2,000,000	4·0	Nil.
Propylenedi-isothiourea 2 HBr	8,000,000	4·0	Slight.
Hexamethylenedi-isothiourea 2 HBr	8,000,000	4·0	Cons.
Decamethylenedi-isothiourea 2 HBr	8/16,000,000	2·0	Nil.
Dodecamethylenedi-isothiourea 2 HBr	8/16,000,000	1·0	"

Cons. = considerable.

It is possible to proceed a step further in our analysis of the origin of the trypanocidal activity of these types of compounds, for high trypanocidal activity is found in the alkylene diamidines (Table V) in which two guanyl groups $NH:C(NH_2)-$ are attached directly to the ends of the methylene chain without the intervention of other atoms or groups. Here again a maximum of activity is reached as the series is ascended, undecanediamidine especially exhibiting a very pronounced trypanocidal activity in vitro, and a curative action in infected mice and rabbits.

TABLE V

Compound.	Titre i.v.	Toxicity.	Therap. effect.
Octamethylene-diamidine 2 HCl	8,000,000	1·0	Very slight.†
n-Decane 1 : 10 diamidine 2 HCl	64,000,000	0·5	Curative.
n-Undecane 1 : 11 diamidine 2 HCl*	256,000,000	0·5	"
n-Dodecane 1 : 12 diamidine 2 HCl	64,000,000	0·5	"

* We are indebted to Mr. F. L. Pyman, D.Sc., F.R.S., of Boots Pure Drug Co., for a sample of this compound.
† "Very slight" implies that maximum tolerated doses prolong the life of the animal, but do not entirely clear the blood of trypanosomes.

TABLE VI

Compound.	Titre i.v.	Toxicity.	Therap. effect.
Nonylamine HCl	500,000	4·0	Nil.
Tetradecylamine HCl	4,000,000	2·0	"
Hexadecylamine HCl	4/8,000,000	2·0	"
Octadecylamine HCl	2,000,000	4·0	"
Octamethylenediamine 2 HCl ..	250,000	8·0	Nil.
Undecamethylenediamine 2 HCl	1,000,000	8·0	"
Tetradecamethylene-diamine 2 HCl	32,000,000	2·0	"

When the guanyl group $NH:C(NH_2)-$ is replaced by the amino group NH_2- there is still noticeable trypanocidal activity in vitro which seems to reach its maximum at hexadecylamine in the alkylamines. In the alkylene-diamines a still greater activity

is observed in vitro, and it is not certain that a maximum for the series has yet been reached.

A few quaternary ammonium compounds (both mono- and di-) have been prepared, but their trypanocidal activity is small (Table VII). Unlike all

TABLE VII

Compound.	Titre i.v.	Toxicity.	Therap. effect.
Trimethylnonylammonium chloride	64,000	2·0	Nil.
Trimethylnonylammonium iodide ..	64,000	2·0	"
Trimethyloctadecylammon. chloride	256,000	1·0	"
Hexamethyloctamethylene *bis* ammon. chloride	1,000	0·25	"
Hexamethyltetradecamethylene *bis* ammon. chloride	16,000	0·5	"

the other compounds they cannot give free bases by hydrolysis of their salts, and this suggests that possibly the trypanocidal activity of the amidines, guanidines, amines, and isothioureas, which are all strong bases forming neutral salts, is a property of the free bases.

The results of examination of a few miscellaneous compounds (Table VIII) supports the view that in the active compounds tabulated above one is dealing with a highly specific biological property conferred by specific chemical groupings.

Examination of the data presented in the Tables shows that provided one knows the trypanocidal titre in vitro of a compound, and its toxicity for mice, one can form a shrewd opinion whether or not the compound will have any therapeutic action in infected mice. Among the compounds examined those possessing the greatest trypanocidal action in vitro are the decane, dodecane, and tetradecane diguanidines (Table I), and the decane, undecane, and dodecane diamidines (Table V). Of the former group decane diguanidine (synthalin) is the least toxic, the minimum lethal dose per 20 g. mouse being about 0·25 mg., although 0·15 mg. frequently pro-

TABLE VIII

Compound.	Titre i.v.	Toxicity.	Therap. effect.
Sebacic acid *bis* imino-ether 2 HCl	1000	8·0	Nil.
Sodium stearate	4000	8·0	"
" palmitate ..	4000	8·0	"
" laurate	4000	8·0	"
" ricinoleate ..	4000	8·0	"
Hexylresorcinol	8000	2·0	"

duces toxic signs; the maximum well-tolerated dose is about 0·075 to 0·1 mg. The toxicity of each of the three compounds of the latter group is about the same, and definitely less than that of synthalin; the minimum lethal dose per 20 g. mouse is about 0·5 mg. and the maximum well-tolerated dose is at least 0·25 mg. As the undecane member is of rather greater trypanocidal activity than either of the other two it was decided to compare its therapeutic action with that of synthalin.

The results of these experiments, which are summarised in Table IX, show clearly the pronounced superiority of the therapeutic action of undecane diamidine. With a single well-tolerated dose (0·25 mg. per 20 g. mouse) no less than 80 per cent. of permanent cures were obtained, and with a dose of about half this size (0·15 mg.) permanent cures were obtained in 4 of 10 mice. Synthalin given in the larger of these doses (0·25 mg.) killed 4 of 5 mice, and with the smaller dose, notwithstanding the fact that it produced toxic signs, only 1 cure was obtained in the 10 mice treated. That the superiority of undecane diamidine is not entirely due to its lower toxicity is further shown by the fact that the very small dose of 0·025 mg. per 20 g. mouse sufficed temporarily to clear the blood of all 5 mice treated with undecane diamidine, but of none of those treated with synthalin. The various methods of treatment by repeated fractional doses bring out equally the therapeutic superiority of undecane diamidine.

TABLE IX—COMPARING THE THERAPEUTIC ACTION OF SYNTHALIN AND UNDECANE DIAMIDINE IN MICE INFECTED WITH *T. rhodesiense*

	Dose (mg. per 20 g. mouse).	Synthalin. No. of mice.	Synthalin. Result.	Undecane diamidine. No. of mice.	Undecane diamidine. Result
SINGLE DOSES.	0·25	5	1 C (T) 4 P	10	8 C 2 R
	0·15	10	1 C 2 P 7 R (T)	10	4 C 6 R
	0·075	10	10 R	—	—
	0·05	5	5 R	6	6 R
	0·025	5	5 NN	5	5 R
REPEATED DOSES.	0·075 on 1st day and 0·05 on 4 following days.	10	2 C 8 R (T)	10	8 C 2 R
	0·05 at 3- or 4-day intervals for 5 doses.	10	10 R	10	8 C 2 R
	0·05 at 3-day intervals for 2 doses.	5	5 R	5	3 C 2 R

C = Cured. No relapse in an observation period of 2 to 3 months.
P = Poisoned. The animal was killed by the drug.
(T) = Toxic. The animal exhibited toxic signs, but recovered.
R = Relapsed. The blood became negative, but trypanosomes reappeared after an interval.
NN = Not negative. Trypanosomes did not disappear from the blood.

The experiments on the treatment of infected rabbits with these two substances are not yet completed, but they are sufficiently advanced to show that even rabbits in a late stage of the infection, with pronounced lesions of the skin, mucous membranes, and genitalia, respond readily to treatment with undecane diamidine. After a few well-tolerated doses all the lesions heal, the animals regain their normal appearance, and they remain well for weeks after the conclusion of treatment. Whether permanent cures of infected rabbits can be obtained by the use of this substance it is as yet too early to say. Sufficient information has, however, been obtained to establish clearly that also in rabbits the therapeutic activity of undecane diamidine is superior to that of synthalin.

It is of importance to note that trypanosomes do not readily become resistant to undecane diamidine, as they do to the aromatic arsenicals. Up to the present, prolonged attempts to make the parasites resistant to this compound, by repeated administration of subcurative doses to infected mice, have failed; and, furthermore, infections in mice and rabbits which have relapsed after a first course of treatment by the drug appear to be just as sensitive to a second course of treatment as they were to the first. Another point of considerable interest is the

fact that trypanosomes, which have been made completely resistant to the aromatic arsenicals and to Bayer 205, respectively, are very sensitive to undecane diamidine, and to synthalin.

SUMMARY

The investigation described in this paper was prompted by the discovery that synthalin has a direct trypanocidal action.

A considerable number of guanidines, isothioureas, amidines and amines, with alkyl and alkylene chains, were prepared and examined for trypanocidal activity. It was found that certain of the diamidines exhibit a powerful trypanocidal action in vitro. With the most active member of the series, undecane diamidine, it is possible to produce permanent cures in infected laboratory animals. As undecane diamidine is of entirely different chemical constitution from all known trypanocidal substances, this discovery is of considerable academic interest. This interest is increased by the fact that resistance to the drug is acquired by the trypanosome very slowly, if at all, and that trypanosomes which have been made completely resistant to the aromatic arsenicals and to Bayer 205 exhibit no resistance to this compound. It is also of practical significance in that it opens up a new field in the search for substances of therapeutic value against trypanosomal infections.

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THE INADEQUACY OF SYNTHETIC ASCORBIC ACID AS AN ANTISCORBUTIC AGENT

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IN 1928–35 Szent-Györgyi demonstrated the presence of ascorbic acid in all antiscorbutic substances. Later, when it was found that the synthetically prepared ascorbic acid also had an antiscorbutic effect, the conclusion was generally accepted that synthetic ascorbic acid and vitamin C were absolutely identical. Recently, however, we have been impressed by the fact that some patients presenting typical prescorbutic and scorbutic conditions have not reacted to the administration of synthetic ascorbic acid in the manner that would be expected if this were the case.

As one of us (A. E.) has provided data (to be published later) concerning the absorption and elimination of ascorbic acid, this clinical observation was subjected to closer investigation. For a time the capillary resistance test of Göthlin was applied to all patients admitted to the service, and, in addition, the serum ascorbic acid of these individuals was determined by the method of Lund and Lieck (1936). A total of 29 patients were found to present signs of hæmorrhagic diathesis together with a low ascorbic acid concentration in the serum, and each of them was given 300 mg. of ascorbic acid daily by mouth for ten days. In all but 3 this led to disappearance of the tendency to hæmorrhage and a return of the serum ascorbic acid to normal. (In passing, it may be observed that one patient, not included in this list, had to be given ascorbic acid by the intravenous route before he was cured.) Three patients, however, differed from the others in that the hæmorrhagic condition was not cured, and the serum ascorbic acid not increased by the oral administration of ascorbic acid. They had all received by mouth a total of 3 grammes, and they were now given an additional 300 mg. of ascorbic acid intravenously every day for ten days. But even then the hæmorrhagic condition was not abolished, nor was the serum ascorbic acid brought up to normal.

After these 3 patients had taken a total of 6 g. of ascorbic acid, they were given the juice of ten lemons every day for ten days. (By the Lund-Lieck method each lemon was found to contain from 20 to 40 mg. of ascorbic acid.) With this change in treatment the hæmorrhagic condition disappeared and the serum ascorbic acid returned to normal.

Methods of analysis.—The serum ascorbic acid was estimated by (*a*) the macro-method of Lund and Lieck (1936) and (*b*) the micro-method of Elmby and With (1937). The ascorbic acid in urine was estimated by the Lund-Lieck method (Dr. Lund kindly placed his method at our disposal before it was published, for which we are very grateful). We have also in some cases used Harris and Ray's method. All analyses were made in duplicate. The ascorbic acid in the serum is recorded as mg. per 100 c.cm. and the ascorbic acid in the urine as mg. The determinations in serum were performed daily.

Only some of the results obtained will be given here; a complete report will be published elsewhere.

THE THREE CASES

CASE 1.—A tailor's apprentice aged 24. He had suffered from diarrhœa since the age of 7, the attacks lasting a month, with intervals of about a month. After he had reached the age of 11, blood and mucus were occasionally observed in the stools. His condition usually improved during summer and autumn, especially when he was able to get more fresh fruit. The disease was always at its worst during the winter. No bleeding from the gums, but he had a complete set of artificial teeth. He mentioned that he bruised easily.

The test-meal (Ewald) showed the quantity of free hydrochloric acid to be 50, and the total quantity of acid 80. Stools: blood ++, mucus +, pus ++ (quantitative test with catalase by the Thune-Andersen and Kemp method). Radiography: stomach, no abnormality; colon, typical findings of severe ulcerative colitis; long bones, some rarefaction. Blood picture: hæmoglobin, 94 per cent. (Haldane); white cells, 5080 (differential count normal); thrombocytes, 320,000 (O. Thomsen method).

The serum ascorbic acid at the beginning of the observations ranged from 0·02 mg. per 100 c.cm. to 0·03 mg. at the end of five days. During ten days' administration by mouth of 300 mg. of ascorbic acid daily the values remained at 0·02–0·03 mg., and when 300 mg. was injected intravenously each day they remained the same. During the administration of lemon juice the figures rose as shown in Table I.

After this the lemon juice was discontinued and the patient was given instead 300 mg. of ascorbic acid each day by mouth. The serum ascorbic acid then fell from 0·78 mg. per 100 c.cm. to 0·02 mg. in fifteen days, rising to 0·03 mg. in the next five days. Lemons were therefore again supplied, and their effect is seen in Table II.

Administration of lemon juice was then discontinued for thirty days, and 300 mg. of ascorbic acid was given by mouth for twenty days with the result that the values fell from 0·76 mg. to 0·02 mg. in fifteen days, rising to 0·03 mg. in the last five days. After this 500 mg. of ascorbic acid was given daily by mouth for ten days, but the serum ascorbic acid still did not rise above 0·03 mg.

TABLE I

Date.	Lemons.	S.A.A.*	A.A.U.†	Göthlin: petechiæ.	Date.	Lemons.	S.A.A.*	A.A.U.†	Göthlin: petechiæ.
April 26	5	0·02	0	88	May 9	5	0·42	14	..
„ 27	5	0·02	0	..	„ 10	5	0·41	14	..
„ 28	5	0·04	0	..	„ 11	5	0·44	15	40
„ 29	10	0·20	0	80	„ 12	5	0·39	16	..
„ 30	10	0·24	0	..	„ 13	5	0·39	16	..
May 1	10	0·22	0	..	„ 14	5	0·44	18	44
„ 2	10	0·24	0	76	„ 15	5	0·74	40	..
„ 3	10	0·23	1	..	„ 16	5	0·75	61	..
„ 4	10	0·25	4	..	„ 17	5	0·76	46	36
„ 5	10	0·26	3	80	„ 18	5	0·78	46	..
„ 6	5	0·35	6	..	„ 19	5	0·76	48	..
„ 7	5	0·36	15	..	„ 20	5	0·82	108	8
„ 8	5	0·44	13	64	„ 21	5	0·84	106	..

* S.A.A. = Serum ascorbic acid (mg. per 100 c.cm.).
† A.A.U. = Ascorbic acid in urine (mg.).

Finally, renewed administration of lemons resulted in the rise shown in Table III.

CASE 2.—A man aged 55. For fifteen years he had had dyspepsia manifested by delayed pain and hunger-pain, and he was admitted to the hospital suffering from melæna. He had furthermore presented symptoms of arterio-sclerotic heart disease and gingivitis and peri-odontitis.

Test-meal (Ewald): free acid, 50; total acid, 70. Radiography: of stomach, pylorogastritis, ? ulcer. Stools free from blood and mucus. Proctoscopy, no abnormality. Blood picture: hæmoglobin, 100 per cent. (Haldane); white cells, 6040 (differential count normal); thrombocytes, 350,000.

TABLE II

Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.	Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.
June 16	10	0·02	0	92	June 21	10	0·14	6	..
„ 17	10	0·02	0	..	„ 22	10	0·52	46	32
„ 18	10	0·12	5	..	„ 23	10	0·64	40	..
„ 19	10	0·12	6	48	„ 24	10	0·68	42	..
„ 20	10	0·13	8	..	„ 25	10	0·82	102	8

The serum ascorbic acid at the beginning of the observation period ranged from 0·02 to 0·03 mg. per 100 c.cm. (five days). With oral administration of 300 mg. of ascorbic acid daily for ten days it rose to 0·04 mg. During this period no ascorbic acid was found in the urine. After this, 300 mg. ascorbic acid was given intravenously daily for ten days, and the ascorbic acid rose in the serum to 0·08 mg. per 100 c.cm. During this period the patient excreted 40–180 mg. in the urine. The substitution of lemons for the synthetic substance for ten days gave the results set out in Table IV.

CASE 3.—Nurse 44 years old. For twelve years she had suffered from dyspepsia, and she also complained of diarrhœa with pain and the passage of a considerable amount of blood and mucus.

TABLE III

Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.	Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.
July 29	10	0·02	0	100	August 1	10	0·18	6	..
„ 30	10	0·02	0	..	„ 2	10	0·48	38	..
„ 31	10	0·12	3	40	„ 3	10	0·58	40	8

Mouth normal. Stools: blood +, mucus +, pus +. Radiography: no abnormality of stomach or intestine. Proctoscopy: mucous membrane œdematous; many bleeding points seen. Blood picture: hæmoglobin, 88 per cent. (Haldane); white cells, 6120 (differential count normal); thrombocytes, 440,000.

TABLE IV

Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.	Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.
June 26	10	0·08	28	30	July 2	10	0·56	40	14
„ 27	10	0·09	11	..	„ 3	10	0·59	32	..
„ 28	10	0·21	16	..	„ 4	10	0·67	36	..
„ 29	10	0·48	19	20	„ 5	10	0·69	38	2
„ 30	10	0·46	18	..	„ 6	10	0·69	96	..
July 1	10	0·52	28	..					

During five days' observation the serum ascorbic acid ranged from 0·02 mg. per 100 c.cm. to 0·025 mg. During ten days' oral administration of ascorbic acid it did not rise above this level, and the patient did not excrete any ascorbic acid in the urine, but after ten days' intravenous administration of ascorbic acid it reached 0·08 mg. During the latter period 40–180 mg. was excreted in the urine daily, and after four days' interval, it was found to be 0·09 mg. In the next six days she was given a total amount of 52 lemons with the result seen in Table V.

TABLE V

Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.	Date.	Lemons.	S.A.A.	A.A.U.	Göthlin: petechiæ.
June 17	8	0·09	0	153	June 20	8½	0·37	19	22
„ 18	9	0·22	17	..	„ 21	9½	0·48	36	..
„ 19	9	0·30	21	..	„ 22	8½	0·66	82	4

CONCLUSION

The 3 cases described had the following characteristics in common: (1) a history of intestinal trouble extending over many years; (2) inability to absorb ascorbic acid, or to retain it after intravenous injection; and (3) cure of both humoral and clinical abnormalities following the administration of lemons.

The explanation we suggest is that for the absorption and retention of ascorbic acid some unknown substance (a co-vitamin) is required. This substance is present in lemons.

This unknown factor may either be part of some other foodstuff (in which case its absorption may be inhibited by certain intestinal diseases), or else it

may be produced in the intestine under normal conditions.

The hypothesis that this factor is the same as the P vitamin found by Szent-Györgyi is being investigated at present by one of us (A. E.).

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STERNAL PUNCTURE IN PERNICIOUS AND ACHRESTIC ANÆMIA

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APLASTIC anæmia of the idiopathic type is a rare disease characterised by diminution of all the formed elements of the blood. When Ehrlich (1888) described the first case, showing aplastic and fatty marrow, which adequately explained the blood picture, aplasia of the bone-marrow was fixed as the criterion of aplastic anæmia and cases which conformed with this description continued to be collected and reviewed (Cabot 1908, Hirschfeld 1911, Smith 1919). It was found, however, that some patients that have the clinical appearance and blood picture of aplastic anæmia show a red hyperplastic, not fatty aplastic, marrow and on account of this discrepancy these cases were called pseudo-aplastic anæmia. Recently more attention has been drawn to this form, which seems to be the commonest (Thomson, Richter, and Edsall 1934). Wilkinson and Israels (1935 and 1936) described a special group of cases characterised by hyperchromia, normal or almost normal gastric acidity, no disturbance of the gastro-intestinal tract or central nervous system, no pyrexia or evidence of hæmolysis, and a lack of, or only a poor response to, the pernicious anæmia factor. Because of their hæmatological similarity they believed that they were dyshæmopoietic anæmias of the pernicious type, and as the hæmopoietic factor is absent from the liver in pernicious anæmia but present in normal quantity in these cases, they believed that the patients were unable to utilise or mobilise that factor and therefore called them "achrestic anæmia."

APPEARANCES IN MARROW

We have recently had at St. Bartholomew's Hospital a few cases which conformed with the description of this achrestic type, and to elucidate their true ætiology their bone-marrow as well as that of pernicious anæmia was studied with the aid of sternal puncture. I examined 9 cases of pernicious anæmia, 7 in relapse and 2 in remission, and 6 cases of aplastic anæmia, of which 4 were of the achrestic type. The white picture of the marrow in the achrestic type was more or less hypoplastic and did not differ materially from that of pernicious anæmia. It is therefore omitted here and only the erythropoiesis that is the centre of interest in both groups is discussed. Findings of all the cases are arranged for the sake of comparison in the Table. The picture of the bone-marrow in a case of pernicious anæmia in relapse and in achrestic anæmia will now be described.

Table showing Sternal Puncture Findings

Case.	Hb. per cent.	Red cells (per c.mm.).	Megaloblasts.	Macroblasts.	Normoblasts.
			Percentage in marrow films.		
Average normal	100	5,000,000	0	0	13
PERNICIOUS ANÆMIA					
1	50	1,360,000	56·5	5·5	5·5
2	46	1,480,000	28	3	7
3	41	1,360,000	64	10	1
4	67	2,130,000	40	15	2
5	45	2,030,000	54	11	6
6	71	3,760,000	50	4	2
7	48	1,440,000	33	8	12
Average	..	..	46·5	8·1	5·1
8	59	2,230,000	7	32	25
9	90	3,600,000	0	3	18
ACHRESTIC ANÆMIA					
10	38	1,625,000	1	25	26
11	41	1,040,000	0	32	4
12	41	1,860,000	0	26	14
Average	..	..	0·3	27·6	14·6

Remarks.—Cases 1 to 7 in relapse; Cases 8 and 9 had liver before admission.

Pernicious anæmia.—Nucleated red cells were present in enormous numbers, often sticking to one another in the form of small islets at the periphery and tail of the film. They were mostly three to four times the size of normocytes, and had basophilic or polychromatic cytoplasm and large finely reticulated nuclei. The diameter of the nucleus rarely exceeded half the area of the cell and there was always a generous margin of cytoplasm. Fully hæmoglobiniferous forms were very few in number and their nuclei were smaller, more coarsely reticulated, and deeply staining. Some of these cells were very large with a deeply basophilic cytoplasm, and not infrequently a few nucleoli among their very fine chromatin meshwork (gigantoblasts or premegaloblasts). In the larger forms the nucleus was always less mature than the cytoplasm, and reticular nuclei might be seen in cells which contained almost a full complement of hæmoglobin. Smaller forms, even normoblasts, were present, their cytoplasm polychromatic or red and their nuclei quite pyknotic.

Achrestic anæmia.—The bone-marrow, though hyperplastic, was distinctly less cellular than in pernicious anæmia, but there were many nucleated red cells which were sometimes in small groups. These cells, on the whole, were large but they never equalled in size the gigantoblasts of pernicious anæmia. They had basophilic cytoplasm and large nuclei which occupied most of the cell area. Nucleoli were sometimes met with, but the chromatin of the nucleus was more diffuse and arranged in coarse bands. Pyknosis of the nucleus was commonly in advance of hæmoglobinisation of the cytoplasm, and cartwheel arrangement of the chromatin, common to most macroblasts and normoblasts, was frequently seen. Many typical normoblasts were present. Only very few of the large cells were difficult to differentiate from megaloblasts and were thus grouped as such. Mitotic figures were occasionally encountered, but were less numerous than in pernicious anæmia.

DISCUSSION

The definition of the terms megaloblast and macroblast, which are sometimes confused and improperly

used, may first be attempted. The presence in abundance of exceptionally large nucleated red cells, which startled Cohnheim (1876) when he first described them in the bone-marrow of a fatal case of pernicious anæmia and which were later stained and defined by Ehrlich (1880), has since been confirmed by various workers, yet the term megaloblast remains up to the present time the bugbear of hæmatology. It was originally defined as a partly or completely hæmoglobiniferous cell two to four times the size of an ordinary normocyte; its nucleus, though larger than that of a normoblast, does not occupy as much of the cell area, is finely reticulated, stains so faintly that it may be missed even by the experienced eye, and contrasts with the characteristic pyknotic nucleus of the normoblast, which stains more deeply than any other known nucleus. The transformation of the megaloblastic marrow of early fœtal life and of the relapses of pernicious anæmia into the normoblastic marrow of late fœtal life and of the remissions of pernicious anæmia, was responsible for the further assumption of a genetic difference between the two forms of hæmopoiesis, megaloblastic and normoblastic (Naegeli 1931). Although no one has seriously challenged the morphological identity of the megaloblasts in pernicious anæmia and in fœtal life, their absolute individuality cannot be accepted for many reasons.

Other large nucleated red cells are noted in normal marrow, but more especially in hyperplastic marrow and certain types of anæmias. They are very often polychromatic, their nucleus occupies most of the cell, and its maturation always precedes that of the cytoplasm—i.e., it undergoes pyknosis before complete hæmoglobinisation of the cytoplasm. To distinguish these from megaloblasts, the term macroblast has been introduced. The distinction between these cells, however, is not as clear cut as the adherents of the genetic theory would lead us to believe—it is a biological process and is more gradual. In the megaloblastic marrow in pernicious anæmia, macroblasts and to a less extent normoblasts can be seen, and it is not always easy in such a marrow to identify every cell as a megaloblast or as a macroblast; Ehrlich himself used to rely on the predominance of a special type of cell to decide the nature of a doubtful one.

Another source of confusion is the adoption by the American school of hæmatology (Sabin 1921, Peabody 1926) of the term megaloblast for the primitive cell of normal erythropoiesis, which was seen to detach itself from the endothelium of the intersinusoidal capillaries. If the term megaloblast is to continue at all in hæmatology, it should, as Turnbull (1936) recommended, be reserved for the cell originally described by Ehrlich. The difficulty in the identification of some cells should leave classification as megaloblast, macroblast, and erythroblast still valid, and the presence of one or a few cells of any of these types should not prevent the classification of a bone-marrow according to the predominant form of cell. We should speak less and less of a megaloblast, macroblast, or normoblast, but more and more of a megaloblastic, macroblastic, or normoblastic marrow. Continuous study of the bone-marrow illustrates this point, as in this series, where the bone-marrow of pernicious anæmia was megaloblastic, while that of achrestic anæmia was macroblastic.

Among the various features of pernicious anæmia, megalocytosis and achylia gastrica are the most constant. Hyperchromia and macrocytosis are both common in many other anæmias such as leukæmia, Hodgkin's disease, some hæmolytic anæmias (Davidson 1932), disorders of the liver (Wintrobe and Shumaker 1933), and some aplastic anæmias. The megalocytosis of pernicious anæmia has its roots in a megaloblastic marrow and it is further associated with the very pronounced anisocytosis of the circulating red cells, which is easily recognised under the microscope or graphically demonstrated by means of a Price-Jones curve. The irregular curve of pernicious anæmia with a wide base—i.e., high coefficient of variation—is quite unlike the symmetrical and narrow curve that is constant in almost all the macrocytic anæmias.

The almost tumour-like megaloblastic erythropoiesis in pernicious anæmia and allied anæmias such as sprue and tropical nutritional anæmia has been traced to the absence of a hæmopoietic factor from the system. The adequate supply of this factor is followed by a more complete and sustained cure than in the case of any other secretory deficiency in the body. In those anæmias in which the size of the red cells is increased, though there is no deficiency of liver principle, anisocytosis is rarely extreme and the predominant nucleated red cell is the macroblast. Hence these anæmias are properly called macrocytic.

A pernicious anæmia that fails to utilise or mobilise the hæmopoietic factor should show the same features, pathology, and course as when this factor is absent from the system for any other reason. In achrestic anæmia, in spite of hyperchromia, erythropoiesis and the whole picture are quite different from pernicious anæmia. The macroblastic bone-marrow, the less severe anisocytosis, the higher reticulocyte count, the occasional presence of an immature leucocyte, and the usually negative indirect van den Bergh reaction in achrestic anæmia contrast with the megaloblastic marrow, the considerable anisocytosis, the low reticulocyte count, the old or multilobulated polymorphs, and the usually positive indirect van den Bergh reaction of pernicious anæmia. The occurrence at a younger age, the absence of any nervous complication, even when the anæmia runs a chronic course, and the remarkable tendency to hæmorrhage, prevent any clinical identification of achrestic with pernicious anæmia. Such cases were perhaps responsible for descriptions in the literature of acute and aplastic pernicious anæmia or pernicious anæmia in the young and in children, formerly not infrequent but rarely if ever seen nowadays.

Hyperplasia of the mother cells with aplasia of the mature forms in the circulation is not peculiar to pernicious anæmia, but has its analogy in aleukæmic leukosis, and in some forms of thrombocytopenic purpura and agranulocytosis. It is doubtful whether the resemblance between pernicious anæmia and pseudo-aplastic or achrestic anæmia is more than superficial and indeed they are probably in no sense blood relations. Witts (1936) has suggested that in ætiology and pathology pseudo-aplastic anæmia merges gradually and indefinably into aplastic anæmia, and that various grades of bone-marrow damage from hyperplasia to aplasia may be produced by the same toxic factor. For the present, nevertheless, it appears wise to distinguish a separate group of pseudo-aplastic or achrestic anæmias, for this common morbid anatomical basis for the syndrome of aplastic anæmia is unfamiliar to many people and the prognosis, though still often fatal, is rather more benign than in true aplastic anæmia.

SUMMARY

1. Erythropoiesis, examined during life by means of bone-marrow puncture of the sternum, is more active

in pernicious anæmia in relapse than in achrestic anæmia, megaloblastic in the former and only macroblastic in the latter.

2. On this basis, as well as other hæmatological and clinical data, the conception that achrestic anæmia is due to lack of utilisation or mobilisation of the pernicious anæmia factor is criticised.

3. Achrestic anæmia appears to have no relation with pernicious anæmia and is better regarded as a special form of aplastic anæmia.

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SUGAR-TOLERANCE TEST OF EXTON AND ROSE

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AFTER criticising adversely the results of sugar-tolerance tests as commonly carried out, Exton and Rose (1934) described a new type of test which they claimed to be more reliable and convenient. Their procedure consists in administering 50 grammes of glucose to the fasting subject, followed by a second dose of 50 g. half an hour later. Blood-sugar estimations are made at the beginning of the test and at half-hourly intervals for one hour. They state that a normal curve should begin within the normal fasting limits, and during the second half-hour the blood-sugar should either fall, or should not rise by more than 5 mg. per 100 ml. of blood. "The criteria for determining diabetes . . . are a more or less steep rise of not less than 10 mg. of blood-sugar in the 60-minute sample following the second dose of glucose and the relation of blood and urine sugar values to the severity of the disease." The new test thus differs from the older one in that two doses of glucose are given instead of one, and the subsequent curve is determined for only one hour instead of two. The authors claim as the result of more than 400 tests, that the new test is more reliable and specific, and also more convenient than the old one. The latter claim is justified by the shorter time required.

Support for the new test was forthcoming from Kelly, Beardwood, and Fowler (1935) who, in comparative tests in 50 subjects, recorded two cases in which the results of the old and new tests differed. In each instance they interpreted the result of the new test to be correct. The last case mentioned in their paper is of special interest and the curves are shown in Fig. 1. In this case the old curve is described by the authors as doubtful and the new as typical of diabetes. The only clinical fact mentioned is that the gall-bladder had been removed in 1922. The old curve rises above the normal, but falls to within the normal fasting limits within two hours. This type of curve was described by MacLean (1932) as a "lag" curve, and recently it was suggested by Lawrence (1936) that it should be named "oxyhyperglycæmic." The latter, in commenting on the rarity with which this type of curve appears to have been noticed in America, ascribed this to the use of venous blood for tolerance tests in contrast to the more frequent use of capillary blood in England. There is good evidence that this curve is due to nothing more than unusually rapid absorption and not to reduced sugar tolerance (Lawrence 1936).

That a subject who can achieve a blood-sugar level of approximately 75 mg. per 100 ml. two hours after 100 g. of glucose as in the above case can be diabetic is quite unacceptable to us. This case suggested, therefore, that the new test might break down when absorption was unusually rapid. To investigate this possibility we selected five cases for comparative tests, two because they had had gastro-enterostomy operations performed and were therefore likely to give "lag" curves, and three because they were found to give "lag" curves during routine investigations.

METHOD

Blood-sugar estimations were made on capillary blood by a modified Folin and Wu technique, the erythrocytes being removed intact in the production of the filtrates. The subjects, with one exception (Case 4), had been on an ample carbohydrate diet. The tests were carried out during the morning following an overnight fast. In Case 4 the new test was carried out first, the old test being made three days later. In the other cases the old test was done first, the intervals between tests being: Case 1, 3 days; Case 2, 14 days; Case 3, 2 days; and Case 5, 7 days. For obvious reasons, defective curves are described as showing reduced tolerance and not as diabetic.

RESULTS

In only one of the following patients (Case 2) were there grounds for suspecting reduced tolerance before the tests, this being the only one in which glycosuria had been found.

CASE 1.—A woman aged 26 with amenorrhœa. Eight months before she had also complained of excessive hunger and a sugar-tolerance test at that time had indicated increased tolerance, the curve reaching 44 mg. per 100 ml. at the end of two hours. At the time of the present tests (Fig. 2) she no longer complained of this symptom, but only of amenorrhœa. The old curve is of the "lag" type, while the new suggests defective tolerance (rise of 43 mg. in second half-hour) of which, however, there was no clinical evidence and no glycosuria had been found. The new test was therefore considered to be erroneous.

CASE 2.—A woman of 51 with a history of boils and glycosuria, on account of which a tolerance test was made. This showed a "lag" curve by the old test (Fig. 3) and reduced tolerance by the new (rise of 12 mg. in the second half-hour). As the old curve attained a blood-sugar level of 63 mg. per 100 ml. at the end of two hours, the high rise was considered to be due to rapid absorption and not to reduced tolerance.

CASE 3.—A man of 31, in whom no clinical diagnosis appears to have been made. Complaint was of depression and lassitude and no diabetic symptoms or glycosuria were recorded. A "lag" curve by the old method (Fig. 4) was again found to be associated with a defective curve by the Exton and Rose test (rise of 20 mg. in the second half-hour).

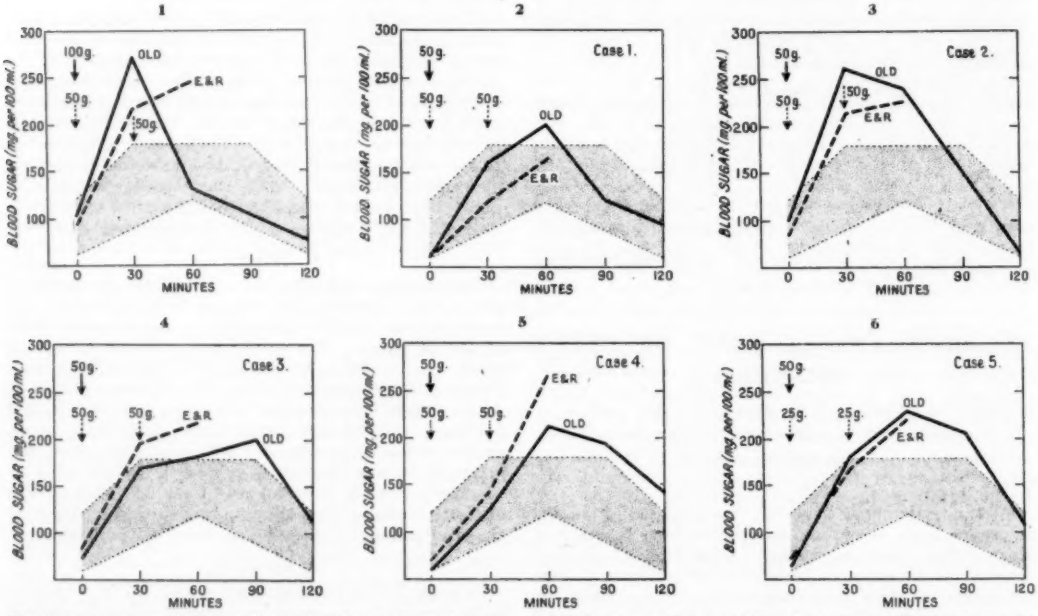
CASE 4.—Man of 28, in whom a gastro-enterostomy had been carried out ten days previously on account of gastric

carcinoma. No glycosuria or other evidence of reduced tolerance had been found. Both tests (Fig. 5) here suggested some lowering of tolerance, the old curve just failing to achieve a normal fasting level in two hours. While the old test indicated only a trifling defect, the new test suggested a more pronounced deficiency (rise of 124 mg. in the second half-hour). The slight defect shown by the old test might have been due to the recent operation or to post-operative dietetic restriction.

Exton and Rose employed a dose of 75 g. of glucose for the old test and two doses of 50 g. for the new. Kelly, Beardwood, and Fowler used 100 g. for the old test in comparing it with two doses of 50 g. for that of Exton and Rose. In England it is usual to be raised, and in one (Case 3) it appeared to be slightly lowered.

DISCUSSION

In four out of the five cases, selected because they appeared to show or were expected to show unusually rapid sugar absorption, the results of the two tests were diametrically opposed. In only one had glycosuria been found and none was considered to have a reduced sugar tolerance. The evidence obtained from these four cases seems to indicate, therefore, that the Exton and Rose test may give a defective curve, in spite of the absence of reduced tolerance, when sugar absorption is unusually rapid. As the new test may



Stippled area represents normal limits for old test. Dotted arrow = doses of glucose in Exton and Rose test, plain arrow that in the old.

FIG. 1 (From Fig. 4 of Kelly, Beardwood, and Fowler).—One of the two cases in a series of 50 in which result of the Exton and Rose test (E. & R.) differed from that of the old test (Old), the former being regarded as correct.

FIG. 2.—From a woman, aged 26, with amenorrhœa; no glycosuria. "Lag" curve by old method, defective tolerance by new.

FIG. 3.—From a woman, aged 51, who had had boils and glycosuria. Old test shows "lag" curve due to rapid absorption, while new test shows reduced tolerance.

FIG. 4.—From a man, aged 31, no symptoms of diabetes. "Lag" curve by old method, defective Exton and Rose curve.

FIG. 5.—From a man, aged 28, ten days after gastro-enterostomy for gastric carcinoma; no glycosuria. New test shows greater deficiency than the old.

FIG. 6.—From a man, aged 45, eight years after gastro-enterostomy for peptic ulcer; no glycosuria. "Lag" curve in old test associated with defective Exton and Rose curve.

give 50 g. for the old test, and having found this satisfactory, we have employed this amount in the above four cases, so that we have used twice as much glucose in the new test as in the old. As this might be considered an unsatisfactory comparison, it was decided to try equal quantities in both tests. In the following case, therefore, two doses of 25 g. each were used for the Exton and Rose test.

CASE 5.—Man of 45, in whom a gastro-enterostomy had been performed eight years before, and who had been in hospital under medical treatment for recurrent peptic ulceration. He had shown no glycosuria or symptoms suggesting reduced tolerance. The results of sugar-tolerance tests are shown in Fig. 6, and again a "lag" curve is found to be associated with a defective Exton and Rose curve (rise of 55 mg. in the second half-hour), in spite of the reduction in the amount of glucose used for the latter.

In none of the patients in which it was investigated (Cases 3, 4, and 5) was the renal threshold found to fail to distinguish between defective tolerance and rapid absorption, it cannot be relied upon as a test of glucose tolerance.

The dissatisfaction expressed by some American writers with the standard sugar-tolerance test is not widely shared in England. As the chief difference in the methods employed in the two countries rests in the amount of glucose given, it seems probable that the American difficulties are due to too large a dose. There appears to be general agreement that increasing the dose of glucose prolongs the period before return of the curve to normal. Also, although MacLean (1932) has stated that further increase in the amount of sugar given (above about 25 g.) does not increase the actual height of the resulting hyperglycæmia, there is evidence to the contrary (Hale-White and Payne 1926, May 1928). May records that out of nine subjects giving normal tolerance curves after 50 g. of glucose, five gave hyperglycæmic

curves and glycosuria after 1000 g. Although, therefore, some workers have failed to obtain increased hyperglycæmia with increased dosage, the positive results recorded indicate that in some individuals at least, increasing the dose increases the height of the curve. Hale-White and Payne also point out that so large a dose as 100 g. is unpleasant to take and often causes nausea, which has a disturbing effect on sugar-tolerance curves. More than 50 g. appear undesirable, although less might be advantageous.

SUMMARY

Comparative tests of sugar tolerance carried out in accordance with the new method of Exton and Rose and the standard method have been made in subjects in whom sugar absorption was unusually rapid.

Four such cases are recorded in whom there was reason to believe that sugar tolerance was not reduced.

In each case the Exton and Rose procedure indicated reduced tolerance, although in one half the recommended dose of glucose was given.

The Exton and Rose test is therefore considered to be unreliable as an index of sugar tolerance.

We are indebted to Dr. J. K. Rennie and Mr. J. Dawson for the clinical material, and to Dr. H. T. Kelly and the Williams and Wilkins Co. of Baltimore, U.S.A., for permission to reproduce the curves in Fig. 1 from the *American Journal of Clinical Pathology*.

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THE LUMBAR PUNCTURE PRESSURES IN SUBARACHNOID HÆMORRHAGE

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Though there are many ways in which subarachnoid hæmorrhage may arise, the most striking is bleeding from a "congenital aneurysm" in a comparatively young person. The rupture of such a sac is by no means so often fatal as its name would suggest, yet we have no control over the leakage. The patient usually saves his own life by a spontaneous clotting inside the bleeding sac. We still know very little about the factors which determine recovery. This has resulted in much confusion on questions of treatment and prognosis. It is not however my intention to discuss the general issues of this condition. There are many classical papers to which reference may be made on these points. The present communication is based on 9 cases that have come under my observation recently. Analysis of such a series shows many aspects of interest, but I wish to confine myself to the correlation of the lumbar puncture pressures to the clinical phases.

CLINICAL MATERIAL

The main facts are summarised in the Table. Of the 9 patients 6 recovered completely. Here the diagnosis was assumed to be that of aneurysm in the absence of evidence of syphilis, tumour, hyperpiesis, septicæmia, and so on. Case 4, an elderly man, had quite recovered from the bleeding, which at autopsy was found to be due to rupture of a degenerated vessel, when fatal lung complications supervened. In Case 5 the aneurysm was found to have burst into the lateral ventricle. In Case 9 autopsy showed that an aneurysm that had bled twelve years ago had become obsolete but that a second sac had given rise to two further leakages, the second of these being fatal. Treatment followed the lines of lumbar puncture in the comatose phases.

Cerebro-spinal Fluid Pressures

Case.	Age.	Sex.	Result.	Day of illness (mm. of C.S.F.).					
				1st	2nd	3rd	4th	8th	10th
1	14	F.	Recov.	200	..	..	..	210	..
2	23	M.	„	No record.	Low.	Very low.	..	..	..
3	41	M.	„	..	..	50	240	..	250
4	64	M.	Death.	170	120	Very low.	Fatal hypostatic pneumonia 9th day.		
5	41	F.	„	170	Death within 3 hours of onset, a few minutes after lumbar puncture.				
6	27	M.	Recov.	140	140	180	..	..	..
7	21	M.	„	No record.	..	120	..	..	..
8	21	F.	„	„	100	40	..	..	..
							12th	14th	19th
9	38	F.	Recov.	1st bleeding ..			145	80	80
			Death.	2nd bleeding, pressure an hour before death = 110.					

CLINICAL VICISSITUDES

Instances of subarachnoid hæmorrhage are generally grouped into the five classes of the apoplectic, the recurrent, the slow leak, the migrainous, and those with lumbago-sciatica symptoms—suggesting that each type followed its own clinical course. But it appears from this series that once the meninges are flooded with blood the after-effects are essentially similar. Patients commonly pass through four stages if recovery is in view: the first stage of prodromata and exciting factors, the second of free bleeding, the third of drawn-out meningeal reaction, and the fourth of residual damage.

First stage.—Here comment must be brief because no lumbar puncture readings are available. In Case 9 the onset of the second and fatal bleeding was in hospital and we were able to note the headache and malaise for several days beforehand. Similar warnings, with an onset in bed, at rest, or without special stress suggested that changes in the sac wall, with perhaps slow leakage, were the real cause of the burst. Whenever exertion seemed to have precipitated the bleeding it was found to be nothing more strenuous than had been taken with impunity over the many previous years that the aneurysm had probably been present.

Second stage.—The phase of free bleeding was generally accurately timed by agonising headache. Consciousness was usually lost not immediately but some minutes later. But it was rather puzzling to find that generally there was spontaneous recovery from this initial coma within half an hour, though there was of course often vomiting, cerebral irritation, and subsequent amnesia. The reason for this may be that the serial lumbar punctures sometimes needed for treatment showed in every patient a lessening amount of blood present. So that if the patient is to recover, all the bleeding seems to take place in the

first few minutes and is then arrested. Once the extravasation had stopped it would be possible for the intracerebral pressures to be adjusted in order that consciousness could be regained.

Third stage.—Even in the absence of further hæmorrhages it is apparently not easy for the meninges to get rid of the hæmatoma which has formed in the basal cisterns and round the cauda equina. In Case 4, at an autopsy on the ninth day, the clot was found to be well organised and most of the free blood had been hæmolysed and absorbed. Yet that patient had never emerged from the semi-comatose state that led to his hypostatic pneumonia. This third stage may last, then, for two or three weeks, during which time the patient is drowsy, confused, and curled up, with bradycardia and slight pyrexia. To vary this stuporose substratum there are episodes of improvement and excitement and times when the coma becomes more pronounced. Of the lucidity and excitement little can be said because lumbar puncture was not done at these times. Compression phases were more common in the early part of the illness and marked by further slowing of the pulse, increased headache, and more neck rigidity. It was under these conditions that most of the thecal pressures were obtained.

Fourth stage.—Sometimes there was a clear-cut end to the third stage and the patient rapidly regained his grasp of affairs and was soon able to take his discharge. There was no residual damage in four of the cases and when seen again twelve months later they were fit and symptomless. In Cases 7 and 8 there was a similar onset in that both had weakness of the right side and aphasia; the weakness recovered almost completely in the third stage but the aphasia improved only very slowly. In one instance it was still improving nine months later, possibly as a result of education. In Case 9 during a hæmorrhage twelve years previously a complete and permanent third nerve palsy appeared; as might be anticipated the nerve was found to form part of the outer wall of the previous and now obsolete aneurysm. Such residual effects give a lead to the localisation of the sac either because there has been neighbouring trauma at the time of the bleeding or because afterwards the aneurysm grows in size by forming a false sac in the hæmatoma.

MANOMETRIC PRESSURES

There is a poverty of thecal pressure readings in the literature of subarachnoid hæmorrhage. In these 9 patients thecal drainage was carried out on 24 occasions. Generally the pressure was measured in a Greenfield manometer as the height of the column of cerebro-spinal fluid (C.S.F.). The results have been summarised in the Table. They may be correlated with the clinical stages in the following way.

Second stage.—These are diagnostic punctures, often made within an hour of the onset of bleeding. In Cases 5 and 9, where death followed soon after, pressures of 170 and 110 mm. are almost physiological. In Cases 1, 4, and 6, where the bleeding stopped and the patient survived, the pressures are again almost normal. Unfortunately there was no record in 3 cases.

Third stage.—These fall into three groups—in the basic drowsy state, in the early attacks of compression, and in the late attacks of compression.

(*a*) Examples of pressure during the stuporose period when there was no compression are seen in Cases 3 and 9. In Case 3 the patient came to hospital on the third day when the reading was only 50 mm. In Case 9 the patient came to hospital on the twelfth day and was then making a slow recovery. Removal of much of the yellow fluid was not indicated in view of the low pressures. It can then be suggested that most of the third stage is unaccompanied by raised thecal tension.

(*b*) The tension in the early compression phases as shown by punctures on the second and third days in Cases 2, 4, 6, 7, and 8. The figures are all on the low side and quite out of keeping with the symptoms. It is therefore not unexpected to find that thecal drainage under these conditions gave little relief. The coma remitted spontaneously as part of the fluctuating course so characteristic of this illness. Indeed in several patients it will be seen that the thecal tension fell at each puncture yet the coma was stationary or getting worse. These episodes might be thought of as "pseudo-compression."

(*c*) In Cases 1 and 3 will be seen rather higher figures at lumbar taps undertaken at a later stage of the illness. These were late attacks of compression, symptomatically identical with the early ones. But the yellow C.S.F. was under a higher tension and drainage gave immediate relief. To these late compression phases may be given the name of "true compression."

DISCUSSION

It must be remembered that these figures only give occasional readings throughout the course of the illness. It was not thought justifiable to draw off fluid very frequently. But I think that it would not be detrimental to patients to introduce a needle and attach a manometer and be guided, when in doubt as to drainage, by the pressure recorded. This leads one to the question of whether the lumbar pressure is identical or parallel with the intracranial pressure. In some instances the blood may interfere with the free communication from the ventricles to the spinal theca. But I am tempted by the uniformity of these readings to regard them as representative of intracranial changes and to suggest three methods by which compression is set up. The initial loss of consciousness is probably due both to the shock of flooding of the meninges with blood and to the sudden distension of the cisterns. The bleeding appears to stop fairly soon, and it would then be possible for the intracranial pressures to be readjusted.

Thecal tension in the prolonged and semi-comatose third stage seems very similar to that found when there is "pseudo-compression." It is very difficult to account for the frequent fluctuations from coma to excitement. It is certain that in these patients there was no fresh bleeding to explain the coma. I think that the mechanism likely to be at work is an aseptic reactionary œdema set up in the tissues underlying the clotted blood, which fills the cisterns and may spread to cover a variable part of the cerebral cortex.

In the attacks of "true compression" another factor is probably at work. This is brought out by the work of Winkleman and Fay (1930). Accepting the views of Weed as showing that the usual path of absorption of the C.S.F. was by way of pacchionian bodies, they sectioned these nodes in cases where symptoms of chronic hydrocephalus were not explained by blocks at other and more usual sites. In particular in 5 cases of subarachnoid hæmorrhage they found blood and pigment clogging the structure of the node. In these and other instances such as carcinomatosis of the meninges, they attributed cerebral œdema, localised cerebral atrophy, and convulsions in the presence of a raised thecal tension to blocking of the filter by debris. So that Weed's classical experiment of injecting lamp black into the cisterns has its counterpart in clinical medicine when there is free cisternal bleeding.

SUMMARY

The lumbar puncture pressures in 9 cases of subarachnoid hæmorrhage are recorded. They show

that most of the symptoms are not associated with raised thecal tension, nor are they a result of it.

I am indebted to Dr. A. Douglas Bigland for permission to refer to these cases, who were under his care.

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Clinical and Laboratory Notes

A SIMPLE METHOD OF ESTABLISHING INTERCOSTAL DRAINAGE

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When intercostal drainage of purulent pleural effusions, rather than rib-resection, is indicated, air-tight drainage is essential. The operation may be required for ill patients with thin streptococcal effusions which are not responding to aspiration and yet in whom rib-resection is inadvisable, or when a tuberculous effusion has become secondarily infected. By the method described drainage can be established

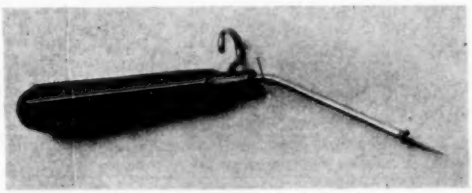

FIG. 1.—The trocar.

with the patient in bed and without the risk of air entering the chest.

Apparatus required.—Hamilton Bailey's trocar for suprapubic cystostomy (Fig. 1), a Malecot's catheter with specially reinforced tip, and a Woulfe's bottle or its modification.

The operation.—The procedure is based upon Hamilton Bailey's method[1] of doing suprapubic

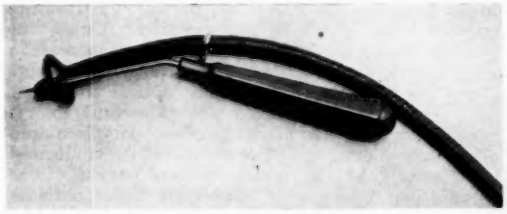

FIG. 2.—The trocar piercing the reinforced tip of the catheter.

cystostomy upon a distended bladder. The skin overlying the site for drainage is infiltrated with Novocain (1 per cent.) and a needle mounted on a small Record syringe is slowly advanced towards the pleura as anæsthetic fluid is injected. Eventually the pleura itself is anæsthetised and the needle pushed on into the effusion; the plunger is then withdrawn and the entrance of pus into the barrel of the syringe will demonstrate that the site for drainage has been correctly estimated. A small incision is made through the skin and subcutaneous tissues. The sterilised trocar, catheter, and necessary tubing are connected to a long glass tube which is immersed in a simple antiseptic solution. These preliminaries prevent the entry of air into the pleural cavity during or after the operation. The catheter is firmly stretched along the trocar (which has already pierced the reinforced tip, Fig. 2) so that the flange at the end becomes flattened (see Fig. 3). The trocar is constructed with a small metal cuff at the base of the bayonet point which allows only the sharp point to perforate the catheter tip (Fig. 1). The trocar is inserted into the pleural cavity until the flange of the catheter is beyond the ribs; as the trocar is withdrawn the flange of the catheter expands and fits snugly against the parietal pleura. Pus will flow out of the chest, and the existence of a negative pressure in the pleural cavity will be demonstrated by the rise and fall of fluid in the long glass tube with each respiratory excursion.

FIG. 3.—The catheter and glass tube. The trocar is in position and has flattened out the flange at the tip of the catheter.

The method has proved satisfactory in its limited scope of employment. It is not intended to be a substitute for adequate drainage requiring rib-resection and the use of a large flanged tube of the Tudor Edwards type.

The trocar is made by the Genito-Urinary Mfg. Co., Devonshire-street, London, W.1.

[1] *Brit. J. Urol.* 1934, **6**, 225.

MESENTERIC OCCLUSION

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I am prompted to record a recent case of mesenteric occlusion by Mr. R. W. Raven's interesting paper on this rare surgical emergency (*Lancet*, Nov. 13th, p. 1131).

The patient was a married woman aged 43. She had had chorea in 1906, attacks of dyspnœa in 1921, and "cardiac asthma and irregular heart" in 1927. The following year a diagnosis of mitral stenosis and incompetence was made and she was given digitalis. In 1933 she came under the care of Dr. Alan Moberly who found the heart irregular and prescribed Nativelle's granules (gr. 1/600 b.d.) In 1934 the heart was regular and compensated. During this year she was operated upon for acute appendicitis with abscess formation. The appendix was removed and the abscess drained for two days. She made a good recovery. In 1936 she was still taking Nativelle's granules; her pulse was slow and regular.

On August 1st, 1936, after a good dinner, she went for a walk. She returned at 9 P.M., sat down at a table, and painted for an hour. She then felt sick and was seized with acute pain in the lower abdomen which later became generalised. She gave herself an enema with a "poor" result. At 12 midnight she began vomiting and she was

seen by Dr. Moberly. At this time there was no swelling nor tenderness of the abdomen, the temperature was normal, and the pulse slow and regular. The pain continued all night with vomiting every half hour. No flatus was passed. At 9.30 A.M. she was again seen by her doctor who found distended coils of small bowel in the hypogastrium towards the left of the middle line. The temperature was now 99·4° F. At the consultation at 11 A.M., thickened rather than distended coils of small bowel were now felt in the left hypogastrium. There was extreme tenderness over this area but not over the rest of the abdomen. A curious crepitant sensation was also noted on palpating these coils. No visible peristalsis was seen. There was no history of the passage of blood nor was blood present on the finger after rectal examination. A diagnosis of intestinal obstruction was made and immediate operation advised.

Operation at 3 P.M. Dr. H. P. Crampton passed a stomach-tube after commencing the anæsthetic (open ether). A small quantity of stomach contents were evacuated. Right lower paramedian incision. On opening the abdomen, a large quantity of blood-stained non-offensive fluid escaped. Thickened coils of intensely congested small bowel were at once seen in the left hypogastrium. They were heavy with blood and lying down towards the pelvis. The corresponding part of the mesentery was œdematous, discoloured with blood, and the vessels were thrombosed. About 3 ft. of ileum were involved. Lateral anastomosis (antiperistaltic) was performed between healthy bowel well above and below the affected area, which was then resected, together with as much of the mesentery as possible. The two ends of bowel were then closed in the usual manner and the great omentum brought down and sutured so as to cover the cut surface of the root of the mesentery and the closed ends of the bowel. A rubber drainage-tube ½ in. in diameter (without side-holes) was placed through the lower end of the incision into the pouch of Douglas. The wound itself was drained by a piece of corrugated rubber placed superficial to the anterior wall of the rectus sheath.

On return to bed she was immediately placed in the high Fowler position (head of bed on 18 in. blocks) and rectal salines with 5 per cent. glucose were given 4-hourly. Pitressin ½ c.cm. and heroin gr. 1/12 were ordered to be given if necessary but were not required. Nothing was given by the mouth for 12 hours. Then sterile water ½ oz. ½-hourly. Second day: sterile water 1 oz. ½-hourly. Third day: 2 oz. with milk 1 oz. hourly. Fourth day: 1 oz. with milk 2 oz. hourly. Fifth day: milk 3 oz. hourly and a little jelly. Sixth day: 3 oz. drinks 2-hourly, jelly, dry toast, and water biscuit. Seventh day: 5 oz. drinks 2-hourly, Benger's food; cascara evacuant and liquid paraffin were given in the evening. Eighth day bowels were opened naturally and thereafter liquid paraffin ½ oz. was given twice a day. Tenth day: rusks and milk, custard, thin bread and butter. Fourteenth day: small quantity of boiled fish, egg. Eighteenth day onwards, minced chicken and milk pudding.

She made an uninterrupted recovery, and at no time was there any abdominal pain or distension.

The occlusion in this case was in all probability due to an embolus from the heart, which blocked one of the branches of the superior mesenteric artery. Appendicectomy had been performed two years previously. It is unlikely that this could have been a predisposing factor. Of interest were the palpable coils of thickened and congested intestine and the crepitant sensation felt on examination. This case supports the principle that "the infarcted bowel and its occluded blood-supply should be excised and if possible the continuity of the bowel restored." As Mr. Raven points out, most careful post-operative treatment is essential if further spread of thrombosis is to be prevented.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section held on Dec. 1st, with the president, Prof. G. GREY TURNER, in the chair, a discussion on the

Treatment of Perforated Peptic Ulcer

was opened by Mr. ZACHARY COPE. Until recently, he said, this treatment had been fairly standardised, but he had found considerable differences of opinion between various continental clinics. The surgeon must therefore form his own opinion on general principles and on the published results. Comparison was misleading for several reasons. Early figures were not truly comparable with modern; the types of cases had altered. Forty years ago most cases had been perforations of gastric ulcer in young, chlorotic girls; now the proportion of duodenal perforations was much increased and nearly all were in men. Mortality had decreased accordingly. Time-intervals had not been recorded in the older figures; the mortality was much higher in cases operated upon more than twelve hours after perforation. The proportion of these cases varied greatly between different clinics and indicated the relative intelligence of the general practitioner and the efficiency of the city's transport service. In Moscow, where Yudin had obtained such remarkable results with gastrectomy, most patients were brought to hospital, by a highly organised ambulance service, within two hours of perforation. Series containing more patients over 50 gave a higher mortality-rate.

Simple suture could be performed by anyone of moderate experience, with little shock or duodenal stenosis. In many cases no further gastric symptoms appeared. Advocates of simultaneous gastrojejunostomy claimed relief of tension and greater facility of nutrition, and sometimes the cure of a chronic ulcer. The supporters of partial gastrectomy assumed unhesitatingly that serious narrowing of the duodenum was inevitable after simple suture, and that nearly all perforating ulcers were chronic and therefore needed radical treatment. In Mr. Cope's opinion, these premises were not established. If a considerable proportion of ulcers were acute and healed after simple suture, advocates of partial gastrectomy removed many stomachs unnecessarily. Unless the operator were a gastric specialist, risk was increased; and if gastric symptoms recurred after simple suture it was not too late to give more radical treatment when the patient's condition was more satisfactory. Distinction must be made between complete and comparative mortality. The complete figure indicated the efficiency of the whole medical service. The comparative figures only concerned those patients who underwent definite operative procedures, and a line must be drawn between patients operated on before and after twelve hours had passed. The best results of simple suture were unsurpassable.

The incision should be large enough to give the operator a full view of the parts. A small incision might not show a second perforation. He should be prepared to make a transverse incision in addition to the vertical if the perforation were at the bend of the duodenum. The field was cleared by continuous suction. Subphrenic abscesses were prevented by seeing that the tube went well above the liver. Washing-out was not necessary, though the stomach might be emptied with advantage. Early cases required no drainage; later cases might have pelvic

drainage, and in some cases a subcutaneous drain in the main incision was useful.

Mr. E. R. FLINT gave the results obtained at Leeds during the past four years: a fatality-rate of just under 23 per cent. in 400 cases. His own figures were 10·3 per cent. for duodenal and 30·7 for gastric ulcer. The hospital figure for 85 cases of duodenal ulcer, all under 24 hours, was 21 per cent. All of these were treated by simple suture except 4 who had a posterior gastro-enterostomy, and these 4 had recovered. He had treated more than half his own cases by this method, with a mortality of 9·7 per cent., and his fatality-rate for simple suture had been 19 per cent. The figures suggested that posterior gastro-enterostomy gave the patient a much better chance if it was performed within a reasonable time of the perforation. The explanation might be that nourishment could be given much sooner and more safely than after a simple suture. After twelve hours the risk of septic peritonitis made the procedure with less manipulation the better.

Spinal anæsthesia, he thought, gave the patient a better chance, for the surgeon could reach the affected place more easily without disturbance. Excision of a duodenal ulcer caused more interference than gastro-enterostomy, and the larger opening was more difficult to stitch up. Early cases hardly ever needed drainage. A drain should never be left in for more than twelve hours. Suction and gentle mopping would relieve the strain on the peritoneum. Gastrectomy was too severe an operation for patients in such a weak condition. Patients with perforated gastric ulcer were much more ill than those with duodenal; they were in the pre-operative stage and ought to be rehabilitated, but there was not time. Posterior gastro-enterostomy done at the time of the perforation rarely led to serious trouble and gave the patient a better chance. Perforation had become much more common in Leeds, possibly because of the popularity of certain so-called medical treatment with patients of the hospital class, who for economic reasons could not follow the proper régime.

Mr. R. L. GALLOWAY reminded the section that the patient was extremely ill and could not have large resections. In his opinion spinal anæsthesia could not be compared with a good general inhalation anæsthetic, for it prevented the surgeon from placing the patient in the Fowler position immediately after operation, so that the exudate could drain into the pelvis. In his hospital, patients were carefully examined and allowed to rest for a while; they were not washed and scrubbed all over, or sent to the theatre shocked, cold, and clammy, but were wrapped up, given a sedative, and allowed to recover from the effects of transport. A good anæsthetist was most important for these notoriously difficult patients who might remain rigid through the operation. The abdomen was opened by the most rapid and clean method, a midline incision from the xiphisternum to above the umbilicus. This opened little tissue and hardly ever caused herniation, especially if the aponeurotic layer were closed with silk interrupted sutures. The exudate was gently swabbed away and the perforation closed with a cross type of suture passing through all the layers in whatever direction was most convenient. Stenosis did not result. He used a four-point stitch, to distribute the strain and diminish the tendency to cut out. A tag of omentum was attached by a few stitches. The right renal pouch was cleaned out by gentle swabbing or suction.

The need for drainage was estimated by the quality rather than the quantity of the exudate, most of which was a protective device and not fluid escaped from the viscus. If it were obviously dirty he inserted a suprapubic tube of corrugated rubber for 24 hours only. The peritoneum had an enormous power of resistance. His recovery-rates for the more elaborate operations were not nearly so good. Gastro-enterostomy did not allow nourishment to be taken earlier. After a simple suture the stomach could take copious fluids. His total fatality-rate was 21 per cent. In conclusion, he emphasised the importance of familiarity with the operation.

Mr. NORMAN HODGSON, speaking of experience at Newcastle-on-Tyne, pointed out that these operations were mostly done at night, by young men, under less than ideal conditions of anæsthesia. The simplest operation therefore gave the best chance of recovery. He was guided in the use of drainage by the number of organisms found free or in the leucocytes of the peritoneal cavity. The fatality-rate was 14 per cent. in 1929. The chief complication had been sub-diaphragmatic abscess. The end-results of simple suture were good: 84 per cent. recovered from acute and 62·6 per cent. from chronic ulcers. For a pyloric ulcer with marked obstruction, a gastrostomy at the time of the suture was much safer than a gastro-enterostomy performed on a shocked patient.

Prof. B. O. PRIBRAM (Berlin) said that most of the cases in his clinic were diagnosed correctly before admission, and so he could operate within the first twelve or fifteen hours. In 80 per cent. he performed primary resection, with satisfactory results. He limited the field of operation as much as possible and avoided exposing the lower abdominal cavity. The palliative operation was reserved for patients in a bad general condition. He preferred local anæsthesia except for restless and excited patients.

Mr. A. M. BOYD reported good results from simple suture in duodenal but not in gastric perforation. Septicæmia with *Bacillus welchii* might be a cause of death. Nearly all the patients who had died had given a long history of gastric trouble, and surgery would therefore seem safer than medical treatment. Perforations often had a punched-out appearance and many patients attributed them to strain.

Mr. H. R. THOMPSON spoke of the difficulty of distinguishing between a gastric and a duodenal ulcer when lymph and œdema obscured the anatomical landmarks of the pyloric region. Gastro-enterostomy did not allow more nourishment to be taken than did the simple suture, for the stoma became œdematous. Spinal anæsthesia caused an alarming fall in blood pressure at about the time the patient left the table. In many cases of perforation of large chronic ulcers the patient gave no previous history of trouble, and Mr. Thompson asked how to diagnose an acute exacerbation of a large ulcer from a perforation.

Sir JAMES WALTON ascribed the improvement in results to earlier diagnosis and treatment by general practitioners. He maintained that it was impossible to distinguish an acute from a chronic ulcer at operation. A large proportion of patients treated by simple suture had trouble afterwards. Every operation should be performed quickly, and the best was that with which the surgeon was familiar. Gastro-enterostomy, however, was the right treatment if the patient was sufficiently well and the surgeon could perform it in a short time. He preferred to start the operation with a suprapubic incision and to drain the pelvis; to use a right paramedian incision and mattress sutures, but no pieces of omentum. The drainage-tube should be left in.

Mr. C. H. S. FRANKAU recommended the use of omentum and drainage.

Mr. RALPH MARNHAM reported a 14 per cent. fatality-rate from St. George's Hospital, all but one of the patients being over 53, and cited an apparently favourable case in which death had occurred from septicæmia a few days after operation.

Prof. J. PATERSON ROSS suggested that the higher mortality from gastric ulcer might be due to a more serious impairment of nutrition. If an ulcer would have been treated properly by gastro-enterostomy apart from the perforation, this operation should be performed when the patient was fit, but not otherwise. Bleeding was a serious risk of gastric ulcer, and so he always made a careful examination to see whether the ulcer extended to the posterior as well as the anterior surface of the stomach, and watched the hæmoglobin. If bleeding occurred, gastrectomy was performed as a secondary operation.

Mr. A. DICKSON WRIGHT advocated Braun's operation: converting a lesser curvature ulcer into a gastrostomy by fitting a catheter into it and threading it through the omentum and out by a stab wound at the side into the duodenum.—Dr. HUGH GAINSBOROUGH impugned all the published statistics as being full of fallacies and suggested that only a large, well-controlled series would give sound data.—Mr. A. E. MORTIMER WOOLF spoke of the value of feeding through a duodenal tube.—The PRESIDENT recommended temporary gastrostomy for the later cases where the peritonitis had attacked the area of the small intestine. He deplored the passing of chloroform.

Mr. COPE, in reply, said that a 3-in. incision was quite large enough.—Mr. FLINT added that he always allowed patients to sit up after a spinal anæsthesia of not more than half an hour.

SECTION OF OTOLOGY

AT a meeting of this section on Dec. 3rd, with Mr. F. J. CLEMINSON, the president, in the chair, a discussion on the

Operative Treatment of Chronic Mastoid Disease

was opened by Mr. SOMERVILLE HASTINGS. Mastoid operations, he said, could be classified according to what was removed and what was done with the resulting cavity in the temporal bone. The objects of the operation, in the order of importance, were: to make the patient safe by reducing his liability to intracranial complications, to retain—and if possible improve—the hearing power, to rid the patient of an unpleasant and troublesome discharge, and to leave as little deformity as possible. Hence, the less the middle ear was interfered with the better. Little damage was done to the hearing capacity by removing the incus, but it was quite otherwise with the mucous membrane covering the round and oval windows. In the mastoid every cell that might be diseased should be removed, if possible, without undue risk of injury to important structures. Owing to the unsatisfactory state of the nomenclature, however, it was difficult to know how far some operators went and what they removed. The simple mastoid was sometimes described as the conservative, and the conservative as the modified radical. The opening left by the removal of the mastoid antrum and cells could be allowed to granulate up, with or without secondary suture, allowing it to fill with blood clot. Or flaps of muscle or periosteum could be used, or some foreign substance, such as B.I.P.P. When no meatal flap was cut, he usually closed the wound except for the lowest half-inch, and packed the mastoid cavity with gauze, which could be changed every second or third day, so that the wound was encouraged to granulate from above down. When in doubt about the condition of the lateral sinus he left the wound open and did secondary suture as soon as the middle ear had been shut off by granulations. He entirely disagreed with the use of muscle and periosteal grafts extensively in all types of mastoid operation. He strongly favoured the use of the meatal flap. The simple operation, when it could be used, gave the best all-round result; but it was unsuitable when there was attic disease or cholesteatoma, or a very small meatus. It had no advantage when the hearing had been completely destroyed, or there was caries of the posterior meatal wall. Where the greater part of the posterior bony wall of the meatus was removed and the mastoid antrum thrown into a cavity common with the meatus the conservative operation had many advantages over the simple. Attico-antrotomy was especially indicated in those with ear discharge. The radical operation was done in the worst cases by all otologists, though it did not always clear up the discharge. He was accustomed to curette the Eustachian tube, but in some cases curettage had not secured the desired result, and it had remained open. Douglas Guthrie's view was that the radical operation should not be done on those under 12, except in the presence of cholesteatoma, intracranial complications, or tuberculosis of the ear.

Mr. GAVIN YOUNG (Glasgow) said the chief motive in operating was to remove potential danger to life. Another reason was when the discharge was copious, and, in some cases, offensive. He confined his surgery to the radical and the modified radical types of operation. In deciding which operation to do, regard must be had to the prospects of retaining the hearing; the state of the tympanic membrane was not of prime importance. Another important factor was the integrity of the ossicular chain.

Mr. WALTER G. HOWARTH strongly urged a proper codifying of the terminology.

Mr. L. GRAHAM BROWN said that six years ago he had shown to the section a series of 6 cases in which conservative mastoid operations were carried out. He described three types of operation: general mastoidectomy, conservative operation, and conservative mastoidectomy, which was a transmastoid antro-atticotomy. The radical operation he called the transmastoid and antro-attico-tympanotomy. He made the smallest possible flap. Many cases that kept up suppuration after the mastoid operation were really cases of chronic fibrositis.

Mr. A. J. WRIGHT (Bristol) was convinced that the tympanum, if one excluded the attic, had great powers of recovery, and it should be handled gently. He thought it was a mistake to try to obliterate cavities. Often the surgeon started in the naso-pharynx and nose, forgetting that infection in the teeth may perpetuate infection of the middle ear.

Mr. T. B. LAYTON said a large part of his work was concerned with poor children whose cavities showed a great tendency to break down. In these cases the surgeon needed to get away from the point of view of the danger to life and to think more about the art of living. When a child's hearing was destroyed it meant impairing its chances of receiving education. It was a serious thing to leave a person in such a condition that he might at any time develop an intracranial complication. He did not think Mr. Hastings insisted strongly enough

on the importance of clearing out every mastoid cell in doing the simple operation.

Mr. A. G. WELLS said he had done 2000 operations on children, and he had performed all the types. Usually skin grafting had been successful. His greatest success had been with conservative mastoid; in 1919 he had 80 per cent. successes, in 1920 over 90 per cent. He did all the after-treatment himself, which produced far better results than when it was entrusted to another.

Mr. F. W. WATKYN-THOMAS did not think the radical operation was always necessary for fistula, especially when it was in the external canal. He had never done it except in suppurative labyrinthitis, when it was necessary to reach the promontory. He always left the Eustachian tube alone.

Mr. M. E. VLASTO had noticed on the Continent that ozone was a good deal used, and some of the declared results were dramatic; it had a great bactericidal value and healing was much promoted by it. It was a method which was worth following up in Britain.

Mr. THACKER NEVILLE asked what happened after the performance of the simple operation. He had had patients come back with one large cell full of pus; one had remained well six years. He treated this first with carbolic and B.I.P.P., lasting a week, then with mercurochrome and ultra-violet rays; the third week he put in a muscle graft. In hospital the wound healed up in a fortnight.

Dr. EWART MARTIN (Edinburgh) remarked that it had been said that far too many radical operations were done in Edinburgh. If there was a chronic otitis media, the attic and aditus being involved, and the upper part of the mastoid and the rest of the cells were sclerosed, some type of radical operation was needed. He agreed that there was a need for drainage and ventilation. But when the case was a chronic one he would cut a flap without damaging the cartilage. He did not think that enough had been heard about post-operative treatment, upon which success depended rather than on the operator.

Mr. E. E. L. BURNIER (Margate) said that since he had been using skin grafts and tying with gauze he had had little difficulty. Enough cartilage must be removed to give a good view into the mastoid cavity. Five days afterwards the gauze was removed, and no other treatment was adopted except swabbing and powdering.—Mr. WILLIAM STEWART said he performed two types of operation: the simple, and the two modified radicals. In his hands a complete radical had never been necessary. The more the healing of the wound was interfered with, the more fibrous tissue would be thrown out.—Mr. T. B. JOBSON said that zinc ionisation was apt to be forgotten by those carrying out the after-treatment. Many of these cavities could be greatly improved, and in many the cavity was rendered quite dry. Of course, it would not cure cholesteatoma.

NORTH WESTERN TUBERCULOSIS SOCIETY

A MEETING of this society was held at the Manchester Royal Infirmary on Nov. 25th, when Dr. E. W. TWINING (Manchester) gave a demonstration of

Tomography by Simple Apparatus

The equipment he uses, which was described in the *British Journal of Radiology* last April, is adapted from the ordinary Potter-Bucky couch. By means of a horizontal lever connecting to the tube column and Potter-Bucky film-carrier by connecting rods, the tube and film are made to move in opposite directions in the same plane. The axis of the lever can be adjusted for taking tomograms in any selected plane of the object to be examined. Speaking of tomography as an aid to diagnosis in pulmonary tuberculosis, Dr. Twining expressed his agreement with J. B. McDougall, of Preston Hall, as to its value in demonstrating the presence of cavities unrevealed by the plain film. The tomogram defined the septa in pulmonary cavities more clearly than the ordinary film did; likewise the loculi in abscess cavities of the lung and the drainage bronchi. Individual vessels in the lung were clearly revealed by tomography, and their course could easily be followed. This was useful in the diagnosis of such conditions as fibrosis, atelectasis, pressure of intrathoracic neoplasms, and localised effusions, where vessels were often pulled out of their normal course. Tomography now enabled the radiologist to define with accuracy the lymphatic glands and other components of the hilum, so that the vague term: "thickened roots" could be amplified. Tomography often obviated the necessity for lipiodol injections, particularly in suspected cases of malignant bronchial stenosis, but in bronchiectasis lipiodol injection was still generally preferred.

In conclusion Dr. Twining remarked that as the tomographic apparatus became cheaper, so no doubt would its use become a matter of routine. Were it only for its value in showing up lung cavities the tomograph would have earned its place, but in addition, its uses in other fields were obvious, not only in the chest and air passages but also, for example, in the study of the skull, the spine, and the nasal sinuses.

KENSINGTON MEDICAL SOCIETY

AT a meeting of this society held on Dec. 1st at St. Mary Abbots Hospital, with Dr. JAMES FENTON in the chair, a discussion on the

Medico-Legal Aspects of Abortion

was opened by Dr. W. BENTLEY PURCHASE, coroner for the northern district, London. He said the subject also involved the sociological, religious, and ethical points of view. His own inquiries had extended over seven years. At present in his district with a population of some 875,000, he could count on one case of criminal abortion every six weeks; there were two married to every single woman. About half the cases were the work of professional abortionists; and in a quarter the identity of the operators was known, but it would be difficult to convict them. He had asked Sir Bernard Spilsbury about his experience, and he had been having cases of criminal abortion at the rate of one a fortnight for many years. Every death after abortion, Dr. Purchase went on, was reported to the coroner, whose inquiry was generally superficial unless there were suspicious or unusual circumstances. He himself had asked hospitals in his district to inform him of all the deaths occurring within 24 hours of admission; he had found more than one reported as being due to food poisoning to be the result of criminal abortion.

Therapeutic abortion was a subject of much discussion. Some had said that the law did not give enough protection to the medical man. But in his opinion no one who had performed it carefully—that is after consultation with a colleague and for sufficient cause—had ever been in serious trouble. In this belief he had the support of the Director of Public

Prosecutions. It had been suggested that the invoking of a second opinion should be compulsory as in cremation. The object of therapeutic abortion was primarily to save the mother's life. Some believed that the preservation of mental health was a sufficient object, but if this was accepted it would become impossible to draw the line, and soon the indications would be extended to anyone who did not want a baby. He strongly urged the medical profession not to ask for a legal definition. The law's line was always very hard and fast, and admitted of no extenuating circumstances.

Illegal abortion was either self-induced or frankly criminal. If self-induced abortion was followed by death it was necessary to summon a jury, with the unpleasant verdict of felo de se; but this had not been returned for very many years. Lately a new term "self-induced miscarriage" had been devised that had helped them out. In the method of self-induction, drugs came first but usually proved ineffective. The woman then turned either to the abortion-monger or to the herbalist, generally for slippery elm. Measures directed against the sale of drugs or implements were difficult to carry out. Advertisements, especially of the "not to be taken by pregnant women" type, could be suppressed. The sale of lengths of slippery elm might be forbidden, because this was responsible for about 50 per cent. of all cases, but it would lead to the use of other instruments, such as crochet hooks and needles, and ultimately would have little effect on the practice. Unskilled abortionists were responsible for awful damage, but the experts generally kept out of trouble for some time. He knew of one that had actually boasted to an inspector that his mortality was under 1 per cent.

Criminal abortion might be stopped by more strictly enforcing the law. The alternative some suggested was to legalise it—for any reason. The spread of birth-control propaganda might tend to eliminate abortion. He believed the public should become "abortion-minded" and be told of the dangers. Encouraging motherhood by grants for children would also help and he thought that too much stress in the newspapers on the maternal mortality frightened many mothers. Notification of all cases of abortion would be a notable step, but there were many difficulties. What should be notified—the abortion or termination of pregnancy? Who should do it—the doctor, the midwife, or the householder? It was useless urging the measure unless it was to succeed; for that it must have the medical profession behind it. The conditions differed from those in the notifiable diseases; there was a stigma attached to abortion. The law could be changed so that the mother was not prosecuted. But then the abortionist would trade on that and persuade her to accept the blame. No mother was prosecuted to-day if by acquitting her they could trap the abortion-monger. Those who recommended legalised wholesale abortion at the whim of the woman—married or single—said that there were no ill effects when it was properly conducted. He thought it unlikely that pregnancy, bound up as it was so closely with the bodily functions, especially of the endocrine system, could be ended abruptly without harm. On the other hand with those who opposed abortion and birth control in any form it was difficult to judge how much their arguments were swayed by personal bias.

Prof. JAMES YOUNG said that the uncompromising position of the law on abortion left the medical profession in the air. Some experienced obstetricians he knew were deterred from performing what one had called "this terrible manipulation" by the lack of legal protection. There would be a great advance if by tightening up or changing the law they could control the qualified abortion-monger working in the guise of a therapeutist. The position of the doctor who knew a case to be due to criminal interference was very difficult, especially if the woman frankly admitted the fact. His knowledge might be important to the public health authorities; on the other hand he was forbidden to act as common informer. Proceedings followed about 1 in 20–40 of all cases of abortion. The profession, Prof. Young thought, would fight strongly against the suggestion of notification; it imposed a burden they should not be called upon to bear. But all forms of notification had at first been opposed and he himself could not decide. It might prove to be the only method of control. Abortion was so rampant that he thought public opinion to-day was in favour of letting the woman do as she liked. Until this attitude was changed, notification would only drive the practice underground and make it even more sinister. He believed that the problem of legalised abortion would one day come before the nation as a major political issue, unless the medical profession themselves could first deal with the problem. Russia's recent volte-face after some years' experiment was a very important point against it.

Dr. LETITIA FAIRFIELD said that abortion in all its forms was not as common to-day as it was believed to be. The official classification needed complete overhaul before they could have a clear idea of its prevalence. Deaths from sepsis had decreased lately and non-septic deaths had almost halved. The L.C.C. hospitals had about 50 deaths a year; this was a large proportion of the total for London. It was surprising that the rate of criminal abortion was not decreasing rapidly with the growth of birth-control propaganda. She quoted statistics published by T. N. Parish from St. Giles's Hospital, Camberwell, of 1000 cases of abortion in 1935. Interference was frankly admitted in 485 and was highly probable in 246. Apart from induction serious sepsis was due to neglect in removing retained products. Of the cases that had used drugs 53 per cent. went septic, and with instruments, 88 per cent. Only 1 death could not be proved to have been due to interference. The value of notification, Dr. Fairfield said, would be to provide badly needed facts, particularly in relation to prematurity, toxæmia, stillbirth, and neonatal death. It would bring home to the women the fact that a miscarriage was not, as was popularly thought, a trivial event. This if successful would do away with all deaths due to non-criminal abortion and the majority of the after-effects. Notification was open to the same arguments in abortion as in venereal disease. It would also cause serious hardship for single women and certain others and the doctors would fail to notify from sympathy. The nation disliked decorating the statute book with laws that could not be carried out, and an unsuccessful measure would do far more harm than good. Referring to legalised abortion, she said that the indications for therapeutic abortion were now fairly well defined in each case. She thought the profession should not be misled by those mentioned by Prof. Young who were afraid of the law—the dangers were purely imaginary. There was no other situation, she thought, where there was greater discrepancy between the general principle and the individual case. In wholesale legalised abortion abuses would inevitably creep in and profoundly affect public life. Who was to

decide that pregnancy must stop—the husband or the wife? The practice was wrong to start with and they could never catch up with its evil effects without abolishing it altogether.

Mr. V. B. GREEN-ARMYTAGE did not think economic or social reasons were valid. Hippocrates forbade abortion, Plato and Aristotle condoned it. The Romans left it to the husband to decide. Before the Nazi régime German women considered the uterus their own until quickening, and then it became the State's. The Roman Catholic church to-day forbade it and through this he had lost eight patients whose lives it would have saved. Most criminal abortions were the result not only of illegitimate but also of illicit intercourse, by widows who might lose pensions and by married women. He thought the present lowering of lay and professional standards in this respect was due to the decreasing regard for life, begun by the war and carried on by the toll of the road. He was told while in Russia that their experiment failed because of the gross invalidism and sterility that followed abortion: in the "abortariums" the morbidity-rate was over 20 per cent. and the death-rate 8 per 1000. The practice always increased with economic distress and in some parts it occurred in one of every two pregnancies. The position of the practitioner in these parts was very difficult and the loss of a wealthy patient to a less scrupulous colleague was often the only reward of virtue. The influx of hungry and undesirable aliens from countries with lower standards was another factor. To the medical indications for terminating pregnancy he would add rape; he had performed the operation for this reason during the late war with a clear conscience. The essence of offence, he concluded, was guilty intent.

Dr. H. S. PASMORE reviewed 117 cases of abortion seen at St. Mary Abbots Hospital in six months. Of these 43 per cent. admitted interference and in 17 per cent. it was very probable. He had investigated the women's knowledge of the risks they ran. Only 5 out of 45 knew it was dangerous; 19 thought it might be and the rest believed it to be safe. He had questioned 50 women about the effects of birth control; 14 single and 16 married women had used none, and in the remaining 7 single and 13 married the means were clearly inadequate. If there was to be no abortion there must be better knowledge of contraception. If all were better educated the menace would almost vanish.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting of this institution on Nov. 25th, with Mr. R. KENNON in the chair, a paper on the

Visualisation of the Pulmonary Artery by X Rays

was read by Dr. E. L. RUBIN. Although, he said, X rays are being increasingly employed as an aid in the diagnosis of heart disease, the study of the pulmonary artery is often neglected. When looked at from the front, the middle arc on the left border of the heart is formed by the main stem of the pulmonary artery, the hilar shadows being largely formed by the right and left pulmonary arteries. When the patient rotates to his left the pulmonary artery can be followed on the screen and is seen to form the upper curve on the anterior border of the heart. In right oblique view the dividing pulmonary artery is seen as a dark rounded shadow beneath the arch of the aorta and in relation to the translucency of the left main bronchus. The impression made by the left bronchus and the right pulmonary artery on the barium-filled œsophagus is a point of diagnostic importance in spite of the controversy to which it has given rise. It may, however, be caused by the pressure of other structures in the neighbourhood, particularly by enlarged mediastinal glands. The left pulmonary artery lends itself well to direct visualisation in left oblique view, because it curves backward towards the shadow of the spine beneath the arch of the aorta. It is seen in this view arching over the left bronchus and crossing the aortic window.

The pulmonary artery may be enlarged in many conditions, including mitral stenosis, congenital heart disease, emphysema, goitre, and sclerosis of the pulmonary vessels. Enlargement of the main stem of the pulmonary artery shows itself as an undue prominence of the middle arc on the left border of the heart—a prominence that may take the form of an increase in length or in convexity, or both. Distension of the branches of the pulmonary artery is reflected in the increase in size and density of the hilar shadows which may be pulsatile, and enlargement of these vessels may be well shown in oblique views of the heart. Congestive changes in the lungs appear radiographically as a general loss of translucency throughout the lung fields together with a "spottiness" which clears as compensation becomes re-established.

The study of the X ray appearances of the pulmonary artery is of importance in that it provides information about the lesser circulation which may be unobtainable during life by other means. Without the help of radiology the physician's information about the pulmonary artery may be largely presumptive and the value of his clinical findings will be enhanced if they are considered along with the evidence provided by direct visualisation of the vessel.

Dr. H. WALLACE JONES emphasised the increasing importance of X rays in the diagnosis of cardiac disease. Mitral stenosis was the commonest condition in which enlargement of the pulmonary artery occurred; it was usually the first indication of a change in the size of the heart and could be detected long before the enlargement of the left auricle, or before there were any clinical signs of cardiac enlargement. The enlargement of the pulmonary artery in thyrotoxicosis had not been adequately explained.

Dr. ROBERT KEMP said that Dr. Rubin's work on the radiological appearances of the heart was of great value to the clinician and at the same time a serious challenge to the traditional clinical methods. The large pulmonary artery seen in thyrotoxicosis was probably linked clinically with the harsh pulmonary systolic bruit sometimes heard in that condition. It would be very interesting too, to visualise the pulmonary artery in those patients whose extreme cyanosis was due to pulmonary arterio-sclerosis.

Mr. W. J. EASTWOOD read a paper on Orthopædics, Old and New.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY

AT a meeting of this society held on Dec. 3rd, with Dr. D. G. RICE-OXLEY, the president, in the chair, an address on the

Surgery of the Heart

was given by Prof. FERDINAND SAUERBRUCH (Berlin). For practical purposes, he said, such surgery began in 1897 when Rehn for the first time saved the victim of a stab-wound by operation. The achievements of

the present day had been attained by the careful correlation of clinical and experimental work and only along the same lines was further advance possible.

The first subject considered was cardiac compression (*Herztamponade*). This was a frequent cause of death after wounds, and Prof. Sauerbruch pointed out that the rapid accumulation of an inflammatory exudate had quite similar fatal results; there were times when puncture of the pericardium might be life-saving in blood-borne infections as well as after trauma. Next he discussed the sequelæ of pericarditis and their surgical relief. There were two types of chronic adhesive pericarditis, often crippling in their effect, and both were amenable only to surgical treatment. Where the adhesions were mainly between the parietes and the pericardium, resection of the ribs and costal cartilages over the heart would suffice, but in other cases when the pericardial space was obliterated and the pericardium actually constricted the heart it must be excised. He had seen many successful results from operation of this kind during the last twenty years. Cardiac distress might also be caused by pressure of a mediastinal tumour, and he described a case in which removal of a mediastinal cyst was followed by immediate relief of threatening cardiac symptoms. His experience in this and similar cases had taught him to search very carefully for a mechanical cause—tumour, abscess, effusion—in all cases of obscure cardiac dysfunction.

Turning to the surgical treatment of valvular defects Prof. Sauerbruch said he thought operation for mitral stenosis inadvisable in the present state of knowledge but he believed that stenosis of the aorta or pulmonary artery might offer an occasional indication. While adopting the most reserved attitude towards all such operations he expressed the hope that further work would enable some patients to be saved from what was often a premature and unnecessary death. As regards the surgical treatment of angina pectoris, he adopted a rather critical attitude towards the various sympathetic operations that have been employed for its relief. Recent attempts to treat the root cause of angina—cardiac ischæmia—by grafting operations seemed to be more logical, and in this connexion he mentioned the work of O'Shaughnessy with omental grafts, Lezius with lung grafts, and Beck with muscle grafts. Some months previously he had examined a group of patients operated on by O'Shaughnessy and had been impressed by the clinical improvement observed.

Finally Prof. Sauerbruch discussed the surgical treatment of aneurysm of the aorta and of the heart itself. In selected cases he had obtained good results with such palliative operations as mediastinal decompression, and he had also deferred threatening perforation by reinforcing the sac with fascial grafts. He described in dramatic fashion his radical operation for aneurysm of the heart which circumstances had compelled him to undertake.[1] Although his patient was still alive and well seven years later, he did not propose to repeat the operation as a planned intervention; but its success had strengthened his conviction that further advance into the difficult territory of cardiac surgery was possible and should be encouraged.

CARDIO-OMENTOPEXY

Mr. LAURENCE O'SHAUGHNESSY, after describing the fatal outcome of an operation at which laceration of the heart had been caused, gave a brief account of the development of his grafting operations for angina pectoris. Seven years ago he was attracted towards the surgery of the thoracic œsophagus and occupied himself with various methods of resection with restoration of continuity within the chest. The only satisfactory method that he could devise involved the transplantation of a large segment of the greater omentum into the chest and its use as a pedicle graft to ensure the safety of his suture line. He was at that time repeating some of the Leriche experiments on ligature of the coronary artery, and he began to apply grafts to the heart in order to supplement its blood-supply. Soon he could demonstrate that vascular connexions formed very readily. It was a long step from these early experiments to their clinical application, but in the meantime he had become interested in the heart failure that often afflicts racing greyhounds—he was indebted for this interest to his reading of Osler's "Medicine," where he describes the case of the famous greyhound Master McGrath, and to a chance conversation about the cause of Mick the Miller's retirement from active racing. In time he was able (thanks to the help of Sir Frederick Hobday and Prof. James McCunn) to subject some of these animals to operation; this was not an experimental procedure but a curative and planned decompression, and in fact the animals were benefited and ran without their previous distress. It now seemed to him that if the greyhound would not merely tolerate but benefit from a cardiac graft, the practical possibilities of the operation would be established beyond doubt. Greyhounds, although they suffered from other forms of cardiac disease, did not suffer from coronary thrombosis, and it was therefore necessary to operate on some dogs, expose the heart, and tie the left coronary artery. When the animals were healed he tried them on the track and found that their racing powers were impaired; and indeed they only finished with difficulty and in a state of obvious distress. Next he operated, and on to the ischæmic heart that had been artificially created he applied his omental graft. A month later he raced one of the dogs again and he completed the full course (565 yards) in good time and quite without distress.

Mr. O'Shaughnessy showed a series of slides illustrating the technique of the operation, vessels entering the heart from a human omental graft and the fixation of an omental graft to the heart without the use of sutures.[2] His case of laceration was, he said, the only immediate fatality that he had had in a series of omental grafts for cardiac ischæmia at the Lambeth Cardiovascular Clinic (L.C.C.) and he had taken steps to prevent it from happening again. He had now enough experience of the appearance of the living heart in various stages of degeneration to know when sutures might be dangerous, and in these circumstances he used an alternative technique in which a chemical substance replaced the suture, and it was found that an equally firm attachment can be obtained in this safe way. When the heart threatened to fail because of an insufficient blood-supply the only logical treatment was in one way or another to attempt its revascularisation, and there were now several operations that could be employed according to the circumstances of the case. All the survivors of six months and over were better—better in the sense that patients previously bedridden were walking about and patients incapacitated from work had returned to work. At the Lambeth clinic operation had been done only after careful consultation with the medical staff—Lord Dawson, Dr. Daniel Davies, and Dr. H. E. Mansell.

[1] See Sauerbruch, F., *Lancet*, 1936, **2**, 780.

[2] See O'Shaughnessy, L., *Ibid*, 1937, **1**, 185.

REVIEWS AND NOTICES OF BOOKS

British Encyclopædia of Medical Practice

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PURSUING its staid course through the entire field of medical practice, the fifth volume of this work opens with an article by Walter Howarth on the endoscopy of the upper respiratory and alimentary tracts, and ends with one on the medical and surgical aspects of goitre and thyroid diseases by F. R. Fraser and Sir Thomas Dunhill. Of the remaining 44 articles, 7 belong to the sphere of general surgery. The endoscopy of the urinary tract is jointly considered by A. W. Badenoch, who writes on urethroscopy, and Clifford Morson, on cystoscopy. Epididymitis in its various forms is discussed by L. W. Harrison, epiphyseal injuries and diseases by S. P. Brockman, erysipelas by John B. Hunter, erythrocyanosis by E. D. Telford, foot deformities by Norman Lake, and the diseases of the biliary tract by Sir David Wilkie. There are 5 ophthalmological articles: H. B. Stallard writes on enophthalmos and exophthalmos, O. Gayer Morgan on eye examination, J. H. Doggart on hereditary eye diseases, A. F. MacCallum on injuries and diseases of the eyelids, and Sir Stewart Duke-Elder on glaucoma. Lionel Colledge's article on epistaxis is the only other representative of the surgery of the special departments, and there is only one gynæcological article, by Daniel Dougal, on the diseases of the Fallopian tubes. W. Russell Brain contributes two of the three neurological articles, the first on epilepsy, the second, in collaboration with J. G. Greenfield, on epiloia; the third, on muscular fibrillation, is by F. M. R. Walshe. Discussing enuresis, Alan Moncrieff wisely reminds us that this pathological problem is still often looked upon by parents as a moral one, and that this attitude must be altered if success in treatment is to be obtained. Gargoylism and glycogen disease, both by R. W. B. Ellis, are the two other pædiatrical subjects considered in this volume. There are four articles on dermatology: one by Rupert Hallam on epidermolysis bullosa, one by Arthur Whitfield on anomalous and atypical eruptions, one by R. T. Brain on erythema, and one by W. N. Goldsmith on fungous diseases. Tropical medicine is represented in two articles, on filariasis and intestinal fluke infections both by P. Manson-Bahr, the second in collaboration with P. A. Maplestone. R. J. C. Thompson's article on frost-bite and trench-foot and L. T. Poole's on gassing and poison gases in war serve grimly to remind us of the amenities of modern civilisation. Under the heading "various," four articles deserve special mention: W. Lindesay Neustatter writes on exhibitionism, R. A. McCance and Elsie M. Widdowson on food, C. S. Myers on mental fatigue, and C. O. Hawthorne on etiquette and ethics in medical practice. The remaining twelve articles belong to the sphere of general medicine and, having little else in common except their positions in an alphabetical list, provide as might be expected a very mixed bag. The cult of the colon is well described in S. W. Patterson's article on enemas and colonic irrigation. C. E. Lakin writes on enteric fevers, L. S. P. Davidson on erythræmia, and G. W. Pickering on erythromelalgia. The general practitioner may feel more at home with the subject of C. W. Buckley's article on fibrositis than with W. M. Feldman's on fœtal diseases; or with M. H. W. Attlee's on German measles than with L. E. H. Whitby's on glanders. But food poisoning by W. M. Scott, gastritis by Dorothy C. Hare, glandular fever by H. Letheby Tidy, and glycosuria by George Graham are all matters which are likely to come his way with greater or less regularity. The volume contains 6 plates and 139 illustrations.

The Art of Surgery

Third edition. By H. S. SOUTTAR, D.M., M.Ch. Oxon., F.R.C.S. Eng., Surgeon, London Hospital. London: William Heinemann. 1937. Pp. 630. 30*s*.

THE previous editions of this work achieved a reputation which renders unnecessary any introduction to the third one, and assures for it a welcome which it richly deserves. The striking arrangement of the pages with wide margins, leaving room for paragraph headings and invaluable little sketches has been retained, and still more line drawings have been added. There is no doubt that a student learns more from a simple sketch, however crude, than from elaborate pictures and photographs; but Mr. Souttar's latest additions have real artistic merit.

The book is so delightfully written that the student can forget that it is a text-book and read it for pleasure; and the medical writer may learn from it how to express technical matters in the King's English. Mr. Souttar has wisely avoided controversial subjects and the more recent ventures which have not yet established themselves in orthodox surgical practice, and the book is thus an ideal introduction to surgery for the student beginning his clinical work. A drawback to its use by the senior student is the absence of any reference to the newer methods of treating acute infections; the modifications of the older operations for the cure of hernia; the value of surgery in the relief of intractable pain; the surgery of the sympathetic nervous system; and the place of hormones both in the ætiology and in the treatment of disease. The function of the book, however, is to provide a sound foundation upon which these newer developments may be superimposed, and without which neither the science nor the art of surgery can be appreciated.

The Medico-Legal Post Mortem in India

By D. P. LAMBERT, M.D., Ch.B., D.T.M. & H. Edin., Capt. I.M.S., Fellow of the Royal Society of Tropical Medicine and Hygiene. London: J. and A. Churchill. 1937. Pp. 113. 5*s*.

THE wealth of forensic material in India has been greatly neglected by medico-legal experts. This particular handbook would have had a greater value if it had been confined to India's special problems, for in other respects it steers a rather wavering course between theory and practice. The author is clearly a faithful student of the Edinburgh school (Sydney Smith has provided a foreword) and an individual observer of practical skill. We have no doubt that pathologists working in India will find his instructions and hints very useful.

General Hygiene and Preventive Medicine

By JOHN WEINZIRL, M.S., Ph.D., Dr.P.H., late Professor of Bacteriology and Director, Alice McDermott Foundation, University of Washington. London: Henry Kimpton. 1937. Pp. 424. 18s.

THE author's justification for adding another to the many American books on hygiene is that his represents a new approach to the subject, that it is cast in a new form. It is divided into eight parts, dealing with the control of disease by means of immunisation; the use of specifics; the control of carriers; sanitation; physical environment (i.e., atmospheric conditions, ventilation, and lighting); personal environment (food, clothing, and exercise); social environment (education, legislation, and administration); and the special measures applicable to age, sex, and occupational groups. In each part there are chapters illustrating, by reference to particular diseases, how the main factor mentioned in the heading may be regarded as governing incidence and mortality and how its influence may be controlled. The idea is quite a good one, but unfortunately it is not easy to determine which of the many avenues of prevention is predominant for each disease. Thus, although meningococcal meningitis is classed under "control of human carriers," Prof. Weinzirl has to confess that control of actual carriers of this disease is impracticable; and the inclusion of pneumonia under "control of clothing" might give a false perspective. The net result is that each disease is dealt with, in spite of the system of grouping, as a problem by itself, involving a number of interlocking questions of prevention and treatment. The book is intended for lay as well as medical students, and it therefore contains rather elementary subject matter which the medical student will need to supplement from other sources.

Health and Muscular Habits

By Lieut.-Col. J. K. MCCONNEL, D.S.O., M.C., Member of the Chartered Society of Massage and Medical Gymnastics; and F. W. W. GRIFFIN, M.A., M.D., Editor of the *Journal of the Chartered Society of Massage and Medical Gymnastics*. London: J. and A. Churchill. 1937. Pp. 159. 5s.

THE refreshing aspect of Col. McConnel's books, which is especially evident in his latest one, written in conjunction with Dr. Griffin, is the relation of his movement-analysis to everyday life. He aims at coaxing the average man to realise just how much better and more efficient he would be if he applied his intelligence to the adjustment of his own mechanism. This little book refers to common errors of faulty breathing, and to bad habits in posture, gait, and occupational movements. In analysing the reasons for these, Col. McConnel leads back, step by step, to the way of eradicating the bad habits. Anatomical facts are clearly explained and illustrated. Reciprocal muscle action of one group to another is explained with practical examples, and there is a touch of originality as well as the fruits of experience in the corrective methods here advocated.

In the average remedial and educational exercise work now in vogue, many faulty methods of presentation have crept in, and are retained by a habit of mind that no longer analyses what it teaches. The authors' simple and unostentatious way of pointing out errors in current practice is disarming. In footwork they deplore the outer-border foot exercises, and encourage the use of weight-bearing positions in order to relate foot, leg, and hip work. This alignment of action is too often neglected nowadays.

In muscle training, they warn against the fallacy of quick swinging movements as a method of stretching contracted muscles. This is a hard-ridden fallacy; only by a relaxation of the contracted structures, engendered by gradual contraction of their lax antagonists, can any actual increase of range be really gained and retained.

The advantage of the book lies in the fact that the movements studied have obviously been carefully tried out upon both normal and abnormal subjects, and that they have been found effective in practice. As an approach to everyday habit problems this book presents a readable and practical help to the everyday man.

Recent Advances in Pulmonary Tuberculosis

Third edition. By L. S. T. BURRELL, M.D. Cantab., F.R.C.P. Lond., Senior Physician to Royal Free Hospital; Physician to Brompton Hospital for Consumption and Diseases of the Chest. London: J. and A. Churchill. 1937. Pp. 320. 15s.

THE last six years have seen a significant advance in our knowledge and understanding of the medical, surgical, and social aspects of pulmonary tuberculosis. This book has not only been made larger but has been substantially rewritten; it is not, as the author justly notes, a mere "hash-up" of the 1931 edition but contains much that is new. Space has been devoted, for instance, to the value of blood examination in phthisis, with reference to Houghton's index; to an account of tuberculosis in children and bovine tuberculosis; and to the classification of types of the disease including Dr. Burrell's own recent scheme. Even the tomograph is not too young to receive consideration. The excellent radiograms are now grouped together at the end of the book instead of being interspersed throughout the text. The chapter on thoracic surgery is one of those that has been recast; it contains Chandler's recent pneumolysis figures and a description of Semb's extrafascial apicolysis with thoracoplasty. It is a pity that the book had gone to press before reference could be made to the extrapleural pneumothorax. This revised edition is indeed more than an account of the recent advances in pulmonary tuberculosis; it is a practical exposition of the whole subject as it stands to-day which deserves a permanent place on the bookshelf of every specialist, and at least a temporary one in the library of the senior student.

Short-Wave Diathermy

By TIBOR DE CHOLNOKY, Associate in Surgery, New York Post-graduate School, Columbia University. London: Humphrey Milford, Oxford University Press. 1937. Pp. 310. 20s.

ALTHOUGH high-frequency radio currents were first used biologically by Schereschewsky 12 years ago, American clinicians have accepted the application of this physical agent to therapy only with some reserve. The fact that Dr. Cholnoky has approached the subject with caution adds to the value of his book, especially to those not conversant with its possibilities. This is essentially a handbook for the practitioner. Only one chapter is given to the physical aspects and three chapters to experimental findings, while eleven are devoted to technique and clinical uses. Those who have followed the history of ultra-short waves as a therapeutic agent will find here the clinical data accumulated in recent years (to 1936) ably presented by Dr. Cholnoky, and the list of references will save them much time in their attempts to cope with the expanding literature on the subject.

THE LANCET

LONDON: SATURDAY, DECEMBER 11, 1937

THE POPULATION BILL

ONLY in the last year or two has much been said about the impending depopulation implicit in the fact that the birth-rate of this country has halved in the last 65 years. A widespread demand has arisen that the causes of this decline should be further investigated, and the debate in the House of Commons last week was a confused expression of this demand.

It is a fact that the fertility statistics of Great Britain are conspicuously defective compared with those of other countries. The Population (Statistics) Bill seeks to remedy this defect by making it possible to ask some new questions when births, stillbirths, marriages, and deaths are registered. The additional questions that must be answered if we are to be able to calculate fertility-rates are neither numerous nor objectionable. On the registration of a birth, information is wanted about the age of the mother, the duration of her marriage, and the birth order—i.e., whether the birth is first, second, third, or *n*th. When deaths are registered we would like to know the marital status of deceased males (whether bachelor, widower, or married man), whether a married woman was childless, and what is the age of the surviving spouse if any. This information would enable the demographer to elucidate many features of present trends of population of which we are now ignorant. The marital status of deceased females is already recorded, and enables us to calculate how many women who die are married and how many are unmarried (the nuptiality-rate). Information as to whether married women who die are childless would throw light on how many marriages are sterile. And the questions asked, at birth registration, about the age of the mother, the duration of marriage, and the birth order would make it possible to compute how far the married people in the country as a whole are reproducing themselves. They would also allow the demographer to calculate differential fertility—i.e., how far people in various occupational groups and geographical areas are replacing themselves. The knowledge thus gained would be the basis for an opinion as to the effects on fertility of such factors as good and bad housing, town-planning schemes, the earnings and occupational stability of the husband, and much else that may influence people in deciding how many children they will have.

It is perhaps unfortunate that the Bill was not limited to these essential inquiries. It was the inclusion of numerous other questions relating to the brothers, sisters, and dependants of former spouses, and previous illegitimate children—not to mention a paragraph allowing the Minister to spread the net even more widely if he wishes—that provoked acrimonious debate. It is understandable that such questions were resented, but the fact remains that some of the critics of the Bill did not show a sufficient understanding of the purpose of fertility statistics. Mr. A. P. HERBERT made an amusing point when he complained that the questions designed to throw light on the death of babies were addressed "(*a*) to people who have just had a baby and (*b*) to those who have just passed away," but such arguments could not be seriously used by those who know how fertility is measured. It is true enough that a long time must elapse before this method of ascertainment gives us a reasonably complete picture of the situation, and it is a pity that the Government did not accede to the demand for a quinquennial census in 1936. So far as it goes, however, the Bill is valuable since it remedies defects in our registration system which have become serious by reason of the low levels to which fertility has fallen. These defects have long been recognised, and in the House of Commons debate Rear-Admiral BEAMISH was able to quote the following words used by the Registrar-General in 1867:—

> "Two grave defects in the registers of the United Kingdom deprive them of much of their utility . . . as records of fact for the solution of the great problems of population. Neither the age of mothers at the births of each of their children, nor the order of birth, is recorded; so that the number of children borne by women at different ages, and in the course of their lives, cannot be ascertained."

It would indeed be regrettable if the significance of this Bill were obscured by objections to its incidental features and by ignorance of the purposes it can serve.

NEW TRYPANOCIDAL SUBSTANCES

IT has long been known that trypanosomes utilise large quantities of sugar. This knowledge led a number of investigators to try to control trypanosome infections in animals by means of drugs that lower the blood-sugar, and it was found that among these Synthalin had a definite therapeutic effect on infections in mice. The implication that this effect was due to diminution in the amount of sugar available for the trypanosomes is hardly logical, since it seems unreasonable to assume that hypoglycæmia of a degree or duration sufficient to bring about destruction of the parasites would not equally damage the host; and indeed, when synthalin was examined in vitro it was discovered to be directly and powerfully trypanocidal, a concentration of only 1 : 260,000,000 sufficing to destroy almost all the trypanosomes of a suspension within 24 hours at 37° C.—a degree of activity quite sufficient to explain directly the therapeutic results of its injection into infected animals. Dr. KING, Dr. LOURIE, and Prof. WARRINGTON YORKE accordingly investigated a number of related substances and, in our present issue, they set forth the comparative trypanocidal effects of a large series of such compounds both in vitro and in experimental infections in animals.

Synthalin consists essentially of two guanidine

groups connected by a chain of ten carbon atoms. By altering the length of this chain and by varying the composition of the terminal grouping it is possible to study in detail any correlation between chemical constitution and trypanocidal and therapeutic effect. It was found that the trypanocidal power varied with the length of the chain, being maximal when there were between ten and fourteen carbon atoms. By further substitution it was then found that the guanidine group was not essential for trypanocidal activity and one of the most active compounds was produced when only the "guanyl" moiety of guanidine was attached directly to a chain of eleven carbon atoms. When compared with the organic arsenicals that are so largely used in human trypanosomiasis this new compound—undecane diamidine—seems to possess properties of considerable promise. Quite apart from their toxicity the arsenical compounds at present in use have the grave defect that, failing to cure, they are apt to produce resistant strains of parasites. With the new drug not only is it possible to bring about the permanent cure of experimental infections, but resistance to the trypanocidal action is acquired very slowly, if at all; moreover, trypanosomes that have been made resistant to the aromatic arsenicals and to Bayer 205 exhibit no resistance to this compound. It will be of the greatest interest to ascertain the action of the new compound against strains of *T. rhodesiense*, which is not influenced by the arsenicals. Furthermore, since Bayer 205, although active against *rhodesiense* infections, is unfortunately of little value in either *gambiense* or *rhodesiense* infections once the parasites have invaded the central nervous system, the penetration of the new drug into this tissue becomes a matter of importance.

Although the work is only in the stage of early laboratory investigation and much remains to be done before any practical application can be made, enough has been accomplished to demonstrate its practical significance. It brings to light trypanocidal substances of a chemical constitution entirely different from those hitherto known, and thus widens the search for substances of therapeutic value in sleeping-sickness.

X RAY EVIDENCE

IN his study[1] of the legal aspects of radiological practice in the United States Dr. S. W. DONALDSON mentions that evidence by radiogram was first used in England at Nottingham in 1896, within four months of Röntgen's discovery. An actress was claiming damages for injuries due to an accident in the theatre. Dr. FRANKISH advised the making of a film at University College Hospital and the result established the definite injury to the plaintiff's foot, the cuboid bone being visibly displaced. In an early American case it was argued that such evidence was inadmissible; because radiograms were photographs of an object unseen by the human eye, there was no proof that the photograph accurately portrayed the object photographed. The court admitted the evidence, however, on the analogy of maps used as explanations to make clear the testimony of experts. Gradually the forensic attitude changed from scepticism to implicit trust. In some of the States the courts insisted that X ray photographs were indispensable for proving damages. The New York Supreme Court has ordered a plaintiff to submit to X ray examination; the judges took judicial notice of the fact that such examination is common and that science has reached a point where, in the hands of specialists, there is little or no danger. Elsewhere X ray photographs of a normal person have been admitted for comparative purposes. Among other interesting questions Dr. DONALDSON deals with the ownership of films. He cites a Michigan case where a company refused to pay a doctor for medical treatment of an injured employee because he had not handed over X ray negatives taken in the course of treating the patient. The court held that the doctor was justified in refusing to surrender the negatives. In the absence of agreement to the contrary, the negatives were the property of the physician or surgeon who made them; it was common knowledge that these negatives were almost meaningless to the ordinary layman; their retention by the physician or surgeon constituted an important part of his clinical record; in the aggregate these negatives would embody and preserve valuable experience. They were scarcely distinguishable in principle from microscopic slides of tissue made in the course of diagnosis or treatment. Dr. DONALDSON remarks that the radiologist is sometimes asked by patients for his films because they want them as souvenirs, sometimes because they feel entitled to possession after paying his fee (on the false analogy of photographs ordered from a portrait-photographer), sometimes because they are disappointed with the professional opinion they have obtained and they want to take their symptoms and their evidence elsewhere.

Dr. DONALDSON'S advice on the conduct of the expert in the witness-box and his general comments on professional practice will be useful to others besides radiologists. He cites an analysis assiduously conducted by American research in respect of 35,000 cases where professional negligence was alleged. Sixty per cent. were found to be due to inopportune remarks by fellow-practitioners who were either ignorant of the facts or were actuated by personal animosity or jealousy. Twenty per cent. were counter-claims, which perhaps means that the patient was using every available weapon in resisting a claim for unpaid fees. Ten per cent. were due to failure to use X rays. The remaining 10 per cent. were attributed to miscellaneous causes as "newspaper articles, cults, negligence of nurses or employees of physicians, alcoholism (rare) and failure to use a method of treatment which is used by the majority or a respectable minority (also rare)." The conclusion that the majority of such cases are due to the unguarded remarks of one doctor about another is significant and instructive.

[1] The Roentgenologist in Court. By Samuel W. Donaldson, A.B., M.D., F.A.C.R., St. Joseph's Mercy Hospital, Ann Arbor. London: Baillière, Tindall and Cox. 1937. Pp. 230. 18s.

INTRACRANIAL HYPERTENSION WITHOUT BRAIN TUMOUR

DANDY has lately described 22 cases in which the signs and symptoms of increased intracranial pressure were unequivocal but in which it was reasonably certain that there was no tumour or other space-occupying lesion.[1] Most of the patients were quite young—half were under 20 years of age—and there were more females than males. The chief complaints, and often the only complaints, were headaches and visual disturbances; the duration of symptoms varied from twelve days to a year or more. In every case papillœdema was present, and in some it was associated with retinal hæmorrhages and serious reduction of visual acuity. In other respects the neurological examination was, as a rule, essentially negative. One patient's blood pressure was slightly raised, and another was syphilitic. The pressure of the cerebro-spinal fluid was abnormally high (between 250 and 550 mm. of fluid), but with only two exceptions it had a normal cell and protein content. Ventriculography was undertaken in every patient and in all of them the ventricles proved to be undilated, symmetrical, and not displaced; in fact they often appeared unduly small. In order to preserve vision a decompression was performed in 19 of the 22 cases; in the remaining 3 it was deferred and eventually proved unnecessary because of spontaneous improvement of the papillœdema and the headaches. At operation the brain usually bulged considerably, and it was frequently noted that an excessive amount of cerebro-spinal fluid escaped from the subarachnoid space. All the patients are now alive and well, the longest recorded interval since operation being ten years. In those who have reported for examination, the papillœdema has subsided leaving varying degrees of optic atrophy. Seeking the cause of this condition, DANDY comments on the fluctuation in tension often seen at the site of the decompression operation. From being flush with the skull, the scalp may rapidly bulge and become tense in a few minutes, and may then as quickly collapse. In DANDY'S opinion these rapid alterations in the intracranial tension may possibly be of vasomotor origin, but he acknowledges that the cause of the syndrome is unknown. The presence of a tumour may be excluded by the normal ventriculograms and the recovery of good health. The patency of the dural venous sinuses was proved by Queckenstedt's test.

A group of 15 cases of a like nature was recorded last year by DAVIDOFF and DYKE.[2] The clinical picture was identical with that of DANDY'S cases, even to the age- and sex-incidence. Air-injection was performed in 13 cases, and no abnormality of the ventricles was detected. Owing to the difficulty of filling the ventricles with air by direct needling, encephalography was often necessary. This agrees with DANDY'S statement that in this disorder the ventricles are frequently undersized. Most of the cases were treated by decompression, supported where necessary by dehydration, and all of them improved; but it is important to note that it was sometimes six months before the papillœdema subsided.

The condition to which MCALPINE[3] gives the title of toxic hydrocephalus has similar clinical features, and so have the cases reported by MCCONNELL.[4] It is clear that the syndrome has often been described under such names as otitic hydrocephalus, serous meningitis, and pseudo-tumor cerebri. In some of these the cause can be stated with certainty—for example, an antecedent infective lesion such as otitis media or acute mastoiditis—but in others the relation to a toxic focus is more doubtful; indeed in only 2 of DANDY'S 22 cases do the records suggest such a relationship. Even when the condition develops as a frank sequel to mastoid disease we are at a loss to understand the pathological processes responsible. Intracranial inflammation is absent and in one patient of DAVIDOFF and DYKE'S, who died from another cause, the brain at necropsy showed no abnormality. For this reason DAVIDOFF and DYKE consider the term "serous meningitis" a misnomer, and they also hold that "hydrocephalus" is inapt because the ventricles are not enlarged. But, as MCCONNELL points out, hydrocephalus merely signifies an excessive amount of cerebro-spinal fluid within the cranium, not necessarily within the ventricles, and this appears to be the factor common to every case. In the absence of evidence of obstruction to the flow of cerebro-spinal fluid, one must assume either that more is secreted or that less is absorbed. MCALPINE favours the former explanation, suggesting that a circulating toxin may make the choroid plexus hypersensitive and that subsequent exacerbation of the toxic focus may give rise to an allergic reaction in the choroid plexus. But although increased production of fluid, such as occurs in acute inflammation, may temporarily raise the intracranial pressure, it is doubtful whether it could do so for long; for the rate of absorption of the fluid bears a direct relationship to its pressure. Moreover, the arachnoid villi might equally well be affected in this way, so as to impair absorption. It is significant that in each series there are exceptional cases in which the cerebro-spinal fluid showed some excess of cells and of total protein. These may be the link between this syndrome of an apparently "functional" disturbance of the circulation of the fluid on the one hand, and true arachnoiditis on the other, and the two conditions may insensibly merge. Without knowing more, it is difficult to find a term for this syndrome that is descriptive without being too compromising as regards pathology. Intracranial hypertension would be satisfactory, but might be confused with the cerebral complications of arterial hypertension. Probably toxic hydrocephalus is a label as little objectionable as any, provided we recognise that the word "toxic" may often be a cloak for ignorance.

[1] Dandy, W. E., *Ann. Surg.* October, 1937, p. 492.
[2] Davidoff, L. M., and Dyke, C. G., *J. nerv. ment. Dis.* 1936, **83**, 700.
[3] McAlpine, D., *Brain*, 1937, **60**, 180.
[4] McConnell, A. A., *Ibid*, 1937, p. 315.

ANNOTATIONS

VITAMIN C AND DIABETES

IT has been clearly shown that a great many people living on more or less ordinary diets are not "saturated" with vitamin C; that is to say, if they are given substantial doses (either as ascorbic acid or as fruit juice) they will at first retain most of what they are given, whereas a "saturated" person will excrete most of it at once in the urine. It has been demonstrated by various workers that vitamin C may influence the action of insulin, and Pfleger and Scholl [1] have been testing its effect on a number of their diabetic patients whom they found to be in an "unsaturated" state. The results of saturating these patients with ascorbic acid were interesting and unexpected. In mild cases of diabetes, receiving no insulin, the amount of sugar excreted was not altered by saturation, although the excretion of aceto-acetic acid was decreased; but the results when insulin was injected were very different. The patients were given a standard diet and insufficient insulin so that they excreted 3–25 g. of sugar a day. When the conditions had become stable the patient was rapidly saturated with ascorbic acid, and by the time this had been done the excretion of sugar had either ceased entirely or had been reduced by 1–10 g., and the dose of insulin could be decreased by 10 or 20 units in some cases though not in others. When the vitamin C was withheld sugar was excreted unless the insulin was increased, but Pfleger and Scholl do not say how long the favourable results continued. Experiments on healthy patients showed the same relation to injected insulin. The sugar-tolerance curve was identical whether the patient was in the unsaturated or saturated state, but when 10 units of insulin was injected and 24 g. of sugar in the form of bread was eaten, the blood-sugar curve was 20 mg. lower in one case and 35 mg. lower in another after the patients had had their fill of ascorbic acid. The investigators suggest that the change is due to an increased capacity of the liver to store glycogen; they do not draw attention to their observation that vitamin C is only of assistance when insulin is injected, but it certainly seems to suggest that the insulin injected is not identical with that made in the body. If these experiments are confirmed it will follow that special care must be taken to see that all diabetic patients taking insulin are fully "saturated." The ordinary diabetic diet prescribed in many clinics in England contains more than 20–30 mg. of ascorbic acid, but many of the poorer patients may not have a sufficiency of fruit. An ounce of orange juice (which can nearly always be obtained from one orange) costs about 1*d.*; an ounce of tomato juice costs less than 1*d.*; and a tablet of 25 mg. of ascorbic acid costs about ½*d.* If the advisability of taking this amount was pointed out, most patients would be able to afford it.

Meanwhile the physiological adequacy of synthetic ascorbic acid is again questioned by the paper from Copenhagen that we publish on p. 1363.

THE PERNICIOUS-ANÆMIA PRINCIPLE

Castle and his colleagues are still trying to solve the problem of the interaction between intrinsic factor (secreted by the stomach) and extrinsic factor (provided by the diet) to form ultimately the pernicious-anæmia principle present in liver or liver extracts. From their studies of the effect of varying acidity on the in-vitro formation of a hæmopoietically active substance from beef-steak and gastric juice they conclude that the intrinsic factor is probably an enzyme active near *p*H 7 but not at levels below 2·5. Liver extract is thermostabile and will even withstand autoclaving. Castle and his co-workers[1] have, however, found it impossible to produce in vitro an equally thermostabile substance. The interaction in the test-tube of beef-steak and gastric juice gives a hæmopoietically active principle which is curative of pernicious anæmia, but it is destroyed by high temperatures and cannot therefore be identical with the liver principle. It can at present only be regarded as a precursor of the liver principle, and as yet we have no clue to the site or method of conversion of one into the other. Castle points out that Klein and Wilkinson[2] claim to have synthesised the thermostabile liver principle by allowing hog's mucosa to interact with beef muscle. They did not, however, submit the resulting active hæmopoietic substance to a sufficiently high temperature to enable them to claim that it was as thermostabile as liver extract. Castle found normal human duodenal contents and intestinal mucosa equally incapable of producing with beef-steak a thermostabile hæmopoietic principle. Though it is possible to cure pernicious anæmia to-day the exact mechanism by which the body elaborates the essential liver principle is far from being understood.

SANATORIUM DESIGN

IN view of the comparatively large number of institutions for the treatment of tuberculosis and the declining mortality from this disease it might be thought superfluous to discuss the design and construction of sanatoriums. There are, however, factors tending to increase the demand for sanatorium beds with the result that the function of the sanatorium is undergoing a change. The general increase in the length of residential treatment has put pressure on the existing beds, whilst the rapidly extending field of collapse therapy, particularly by major surgical methods, is demanding facilities in the sanatorium similar to those of a general hospital. As Mr. Lionel Pearson said in a paper which he read to the Tuberculosis Association on Nov. 19th, it is unlikely that the "corridor" type of planning (that is an extended front which accommodates all the patients' rooms on the south or south-east side with the service rooms on the north of a corridor) will be seriously modified in the future; this type of plan nevertheless provides a number of problems which still await solution. Heating and ventilation are always difficult in sanatorium construction; Dr. James Watt brought this out very clearly at the Royal Society of Medicine in 1933. It is too much to expect of wards whose windows are kept wide open during the day and night that they should feel comfortably warm on a winter's day; but adequate heating is essential for dining-rooms and staff quarters. The elimination of noise is a vital point; and yet this, as Mr. Pearson suggested, has been neglected even in hospital construction. Now that sanatoriums are to have wards suitable for the reception of major surgical cases the conduction of sound throughout the building

[1] Pfleger, R., and Scholl, F., *Wien. Arch. inn. Med.* Oct. 31st, 1937, p. 219.

[1] Castle, W. B., Heath, C. W., Strauss, M. B., and Heinle, R. W., *Amer. J. med. Sci.* November, 1937, p. 618.
[2] Klein, L., and Wilkinson, J. F., *Biochem. J.* 1934, **28**, 1684.

must be reduced to a minimum. In this country the open single-story pavilion type of ward has found general favour; on the Continent the multi-storied block building is almost always used for the treatment of tuberculosis. Both types have their pros and cons, but if surgery is to be increasingly practised the more easily controlled block building will come to hold the field. On the other hand where patients only require a routine of graduated rest, the pavilion system, as Mr. Pearson remarks, provides an atmosphere of peace and rural quietness in contrast to the continental impression of a cosmopolitan hotel. There is evidently room for more than one type of building; at present the majority of patients are of the chronic ambulant type, and the preponderance is likely to increase. These cases require mental stimulation and encouragement as well as treatment; design and decoration should suggest cheerfulness and avoid any sense of confinement and restriction. There is also the question of expediency. The construction of a sanatorium is a tangible and easily appreciated method by which a local authority can demonstrate its interest in the treatment of tuberculosis. Lavish expenditure on institutions may hide or impoverish more important but less spectacular branches of the anti-tuberculosis scheme; nevertheless it is desirable that the sanatorium shall attract rather than repel and instil confidence rather than fear into its whole population, patients and staff alike.

TREATMENT OF UNDULANT FEVER WITH SULPHANILAMIDE COMPOUNDS

MOST of the therapeutic successes hitherto recorded with sulphanilamide and allied substances have concerned relatively acute infections accompanied by a bacteræmia. Whether success is likely to attend the treatment of more chronic infections in which the organisms have established themselves in multiple foci in various tissues of the body is more doubtful. Under these conditions the organisms may be protected from the drug and continue by their growth to give rise to local or general disturbance. Habs and Röper,[1] for example, have recorded their complete failure to influence the progress of streptococcal lymphadenitis in guinea-pigs. In this disease multiple glands are usually affected and the organisms are found embedded in caseous pus surrounded by a thickened capsule. In spite of the fact that repeated intraperitoneal inoculations of Prontosil soluble were given, amounting to a total dosage of 12·5 c.cm., no beneficial effect whatever was noticed. That the fault was not due to any special insusceptibility of the strain of streptococcus was shown by the usual intraperitoneal mouse technique. Whether chronic infective diseases such as tuberculosis and undulant fever are likely to prove amenable to sulphanilamide treatment is still not entirely clear, though the balance of evidence seems to be against it. Béthoux, Gourdon, and Rochedix,[2] however, describe the apparently successful treatment of a patient suffering from undulant fever, probably caused by the *melitensis* type, with compounds of the sulphanilamide group. For four weeks the patient was daily given 2 g. of benzyl sulphanilamide by mouth together with an intravenous injection of 20 c.cm. of a 6 per cent. solution of Soluseptazine, a more soluble and more complex derivative of this substance (presumably corresponding to the English Soluseptasine). The intravenous injections were then stopped, but oral administration of the drug was kept up for another fortnight till the patient was discharged. Four days before the treatment was begun a blood culture was positive; five weeks later it was negative. Though Béthoux, Gourdon, and Rochedix have no doubt that the successful outcome of this case was attributable to the specific treatment given, it may be noted that the patient's temperature had fallen to normal before the treatment was begun. Considering that the fever had lasted four months it is not improbable that the natural end of the disease was just being reached. More convincing evidence than that put forward by these authors will be required before hopeful conclusions can be drawn on the value of the sulphanilamde group of drugs in the treatment of undulant fever.

[1] Habs, H., and Röper, E., *Z. ImmunForsch.* 1937, **91**, 360.
[2] Béthoux, L., Gourdon, E., and Rochedix, J., *Bull. Soc. méd. Hôp. Paris*, Nov. 15th, 1937, p. 1297.

CRIPPLES

THOUGH it is 120 years since the first hospital devoted solely to orthopædics was founded at Birmingham, attempts to cater for the general needs of cripples throughout the country are of recent growth, and largely owe their origin to the experiences of the war. In 1919 Sir Robert Jones and Mr. G. R. Girdlestone published their "National Scheme for Cripples" which led to the formation of what is now the Central Council for the Care of Cripples under the auspices of the British Red Cross Society. The aim of the Council was to cover the whole of the British Isles with a system of orthopædic hospitals, each with a group of satellite out-patient clinics, and to establish vocational training centres and local employment bureaux to help with rehabilitation. A door-to-door census which the Council carried out in four representative areas to help them to estimate the magnitude of their task showed that there were about 3 children per 1000 of the total population who needed orthopædic attention, while the accommodation provided for them in institutions and in special schools was quite inadequate. The Council therefore proceeded to promote the formation of local voluntary associations to coöperate with the public authorities in remedying this state of affairs, and largely through its efforts the National Scheme has since made rapid strides.

The Council has now published a handbook[1] which sets out what has been achieved and what remains to be done. If a cripple is defined as a person who has not the full use of all of his limbs and trunk, it is estimated that there are about 200,000 actual or potential cripples in the British Isles, and that about 80 per cent. of the former have become so from preventable causes. About half the total number are children. The essentials of a complete service for these unfortunates include facilities for their discovery in the early stages, for the provision of expert treatment without delay, for their education, which is even more important to a cripple than to a normal person, for training them in suitable vocations, for finding them employment, and for attending to their general welfare by the provision of books, entertainment, invalid chairs, tools, and the like. Public authorities have extensive powers and duties which cover a great deal of such a service. In most areas, though by no means in all, the authorities provide for the needs of crippled children up to the age when they leave school, but they rarely make provision for any form of vocational training, and, as regards adults, though they have wide duties in respect

[1] Handbook on the Welfare of Cripples. London: Central Council for the Care of Cripples. 1937. Pp. 89. 1s.

of those who are either tuberculous or destitute, they can do nothing for the large number who do not fall within those categories. There is then still great scope for voluntary effort in filling these gaps and the Council is continuing with its aim of starting voluntary associations in every county and of covering the country with a network of orthopædic units.

ANÆSTHETICS AT CONFINEMENTS

THERE is valuable information in a paper by Bill [1] on analgesia and anæsthesia in relation to the shortening of labour. The commonly accepted opinion is that hypnotics, analgesics, and anæsthetics inevitably prolong the process of delivery, and it is well to realise that with appropriate care they may be made to have the opposite effect. Unfortunately the system of practice here advocated and illustrated cannot be carried out effectively without hospital facilities or at least the continuous coöperation of a skilled anæsthetist, and these conditions cannot be fulfilled in the vast majority of confinements. Nevertheless the lessons taught may have an influence even on everyday non-hospital midwifery. In brief it is advised that scopolamine should be used for primiparæ in the earliest stage of labour, starting as soon as there is real discomfort; Sodium amytal is prescribed for the same stage in multiparæ; and inhalation analgesia is given to both classes of patient during the second stage, going on to real anæsthesia for the climax of delivery. The inhalation agents used are gas-and-oxygen or ether. The latter is used to the full extent when the obstetrician wants to reduce the activity of the uterus. Nitrous oxide never has this effect, and Bill believes that his premedication never interferes with uterine contraction or affects the condition of the infant. When scopolamine is used its innocuousness is assured by never giving an injection of it less than three hours before the time when delivery is anticipated. The significance that Bill attaches to proper management of the anæsthetic at confinements may be shown by two quotations from his article: "Clever administration of the general anesthetic is the most important part of the conduct of painless labour," and "to give just enough anesthetic to relieve pain and not slow labour is a real art." The Cleveland Maternity Hospital has aimed at painless labour for some twenty-five years and the principles and practice there evolved are the foundation of the present report.

GERLACH'S CANCER GERM

AT a meeting of the Gesellschaft der Aerzte in Vienna last October Dr. F. Gerlach claimed to have isolated from malignant growths of man and of animals a filtrable organism which could be grown in cultures and which on injection into animals produced malignant growths. His paper is published in the *Wiener klinische Wochenschrift* of Nov. 26th, and as the claims were widely noticed in the English daily press a brief summary of his result may be of interest. The pressed juice of malignant tumours after dilution with Ringer's solution was passed through various filters, and blood-agar media and other fluid media were inoculated with the fluid thus obtained. After incubation for several days under anaerobic conditions cultures developed which could be kept alive by subculturing. The organism is stated to resemble that of bovine pleuro-pneumonia, and its injection into animals produced immediately an exudate in the serous cavities; later, after intervals of very varying length, tumours appeared. In one mouse, for instance, a carcinoma of the submaxillary gland appeared 27 days after intraperitoneal injection and there were then already metastases in the liver and lung. In another mouse a carcinoma, presumably of the mamma, developed 20 months after an intraperitoneal injection. Tumours have also been produced in rats, in fowls, and possibly in animals of other species, although the paper does not say so. The tumours appear sometimes at or near the site of injection, but more often in organs quite remote from the injected site. The same organism was obtained from human and from animal tumours, from carcinomata of different organs, and from sarcomata. The same organism produced carcinomata and sarcomata in different organs and in different species. Virus bodies could be seen in the cells of the tumours from which the organism was isolated, in the tumours produced by it, and in several transplantable animal tumours such as the Ehrlich mouse carcinoma, the Rous fowl sarcoma, the Jensen rat sarcoma, and the Brown Pearce rabbit carcinoma. Altogether 14 tumours were obtained in 342 animals—i.e., in 4 per cent. of the injected animals. Even if one assumes that all the tumours that appeared were true malignant new growths, which is by no means certain from the data given in the paper, the small number of tumours observed does not exceed the number of spontaneous tumours that one may expect to find in laboratory animals, especially the short-lived rat and mouse, kept under observation for several months.

The story is not new. It reveals no appreciation of the pathology of cancer.

TREATMENT OF PSORIASIS

ONLY one feature is constant in the past and present nosology of psoriasis—the annual crop of new cures. From the time when bathing in the Jordan (and very possibly in adjoining sulphur springs) brought relief or remedy, down to the present day with its application of radio-active waters, ultra-violet rays, X rays, Grenz rays, chrysarobin, tar, mercury, arsenic, and even gold, the list of cures has lengthened, so that one wonders that any cases of the affliction are still to be found, and can scarcely credit Lane and Crawford's observation "that it still constitutes 6 per cent. of all attendances at a dermatological clinic." [1] It is very doubtful however whether a real cure, in the accepted sense of the term, has ever been achieved by therapeutics, although some cases certainly recover spontaneously and remain permanently free; indeed R. Hallam puts the proportion of such recoveries as high as 10 per cent. We still know nothing of the ætiology, although an immense amount of time and money has been expended in testing numerous and ingenious conjectures about it. The preponderance of dermatological opinion to-day seems to favour a metabolic fault, and when Grütz and Bürger some three years ago [2] announced that they had discovered a demonstrable disturbance in the assimilation of fat and lipoids in all their cases, it seemed as if the problem of causation was at long last solved and a sure means of treatment found. But their claims have not been substantiated, and their irksome treatment by deprivation of fats (though like most other measures it is sometimes beneficial) has now been relegated to the limbo of the half-effective and non-proven. Until the pathology is elucidated it is not very likely that the results

[1] Bill, A. H., *Amer. J. Obstet. Gynec.* November, 1937, p. 868.

[1] Lane, C. G., and Crawford, G. N., *Arch. Derm. Syph.* 1937, **35**, 1051.

[2] See *Lancet*, 1934, **2**, 605.

of any treatment will be consistent and reliable, and only a cautious welcome can be given to the latest candidate for therapeutic honours. This is none other than our familiar friend, vitamin D, administered in massive doses, daily by mouth, over periods up to twelve weeks. The detail of this method, which is certainly not free from risk of hypervitaminosis, can be studied in a report by Ceder and Zon.[3] They state that of 15 patients with chronic widespread psoriasis, of whom 12 were treated with one product (A) of irradiated ergosterol and 3 with another (B), 11 obtained complete involution within twelve weeks, 2 obtained partial relief, and 2 were not benefited. After an interval ranging from six weeks to five months 6 of the "cured" cases had relapsed, while 4 of the others had remained free for three to eight months. At first sight these results seem encouraging, but a similar proportion of "cures" can be obtained in chronic cases in a small fraction of the time by putting the patient to bed and anointing him with chrysarobin or Cignolin. If the clearance thus effected is followed by a fortnight's tar treatment and the patient is instructed to pay particular attention to his scalp, where chronicity is usually greatest, the large majority will show no sign of recurrence for periods varying from six months to two years and more. If such results can be obtained by a purely local treatment in almost all cases, the claims put forward for the vitamin and similar lines of therapy will have to be substantiated by success in a *large* number of cases by independent observers; further it should if possible be proved that all psoriatics are in fact suffering from deficiency of the vitamin. The likelihood that this is so seems less when one reflects on the oft-repeated observation that psoriasis is often most prevalent and extensive when the patient is fit and well. Not infrequently it will disappear during or after some febrile illness, only to relapse on the return to normal health, and pyrogenic injections will sometimes give a similar temporary improvement.

FRACTURE OF THE SPINE

THE principles to be observed in the treatment of spinal fractures are the same as those to be observed in the treatment of fractures elsewhere—viz., to reduce the deformity, to maintain the fragments in position while they are healing, and to restore the function of the injured part. In the past there was a tendency to pay relatively too much attention to the fixation of the fragments, with the result that the reduction of the deformity and the restoration of function were rather neglected; but of late this tendency has been corrected, and Watson Jones [4] in England and Böhler [5] in Austria have described systems of treating fractured spines which ensure reduction of deformity, restoration of function, and a shortening of incapacity. In outline Watson Jones's system for lumbodorsal fractures is as follows: the deformity is reduced by over-extension, a well-moulded plaster jacket is applied, and active movements of the muscles of the trunk are started as soon as the plaster is dry. The patient is allowed up in about ten days, the plaster is removed in about four months, and the patient is fit for heavy work in six months. This rapid recovery is due mainly to the exercising of the muscles while the plaster cast is being worn. It is important that these exercises should be supervised, for not only will this ensure that they are done properly, but it will also give an opportunity for the patients to see each other perform, which will increase their efforts and improve their morale.

In Russia the functional treatment of spinal fractures is carried still further. At the Sklifassovsky Hospital in Moscow [6] they do not use any method of rigid immobilisation such as the plaster cast, but instead they aim at making the patient develop for himself his own spinal support, "un corset musculaire," by graduated, supervised exercises. They maintain that the vascular cancellous bone of the vertebræ heals very quickly, and that the danger of secondary displacement is much exaggerated. The patient simply lies on his back in bed and reduction of deformity is effected by gradual extension, the bed being suitably inclined. The exercises start after the first few days and they gradually increase in duration, complexity, and vigour, and in the amplitude of movements allowed. They must never cause pain. By the end of the second month the patient should be able to raise himself up by arching his back so that he is suspended between his feet and the back of his head, with his elbows as an additional balancing support. After 8–10 weeks he is allowed to stand; a little later sitting is allowed, having been delayed so long because of the flexion of the spine it necessitates. When he can walk he may leave hospital, but he still attends as an out-patient for further exercises until he returns to work, which he may do as soon as four months after the accident.

The essential difference between this Russian method and the more usual modern method using a plaster jacket lies in the early movements of the spine allowed in the former. Apart from protection of the spinal cord the function of the vertebral column is to support and to move. Now it may be argued that the plaster-jacket method develops the function of support but neglects that of movement—that although the muscles are exercised they do not move the intervertebral joints, which are rigidly immobilised for four months, with the result that when the cast is removed the return to normal is a long and painful process. But to this it may be replied that when the functional method is used the patient must lie on his back for ten weeks instead of ten days, and that experience proves that if all the muscles around a joint have been actively exercised that joint will soon move again normally even after four months' immobilisation.

DEBATE ON NURSING IN THE COMMONS

THE quotations from the final report of THE LANCET Commission on Nursing in the course of the long debate in the House of Commons last Friday on hours of employment were much more detailed than could be indicated in our brief report (see p. 1405) Those in favour as well as those against the present Bill used the facts set out in the "wonderful inquiry" in support of their arguments, and its comprehensiveness and impartiality drew praise from all sides of the House. Mr. Erskine Hill reminded members that the report contained many recommendations besides those concerned with hours and cited specially those for separate bedrooms, adequate bathrooms, airy and well-appointed common- and dining-rooms, and well-cooked diet. Sir Francis Fremantle pointed out that no specific number of hours of day duty per week had been recommended by THE LANCET Commission, 57 hours being laid down as the maximum

[3] Ceder, E. T., and Zon, L., *Publ. Hlth Rep., Wash.* Nov. 5th, 1937, p. 1580.

[4] Jones, R. W., *Brit. med. J.* 1931, **1**, 300.

[5] Böhler, L., Treatment of Fractures, 4th English edition, Bristol, 1935.

[6] Gorinevskaja, V., and Drewing, E., *Lyon chir.* 1936, **33**, 44.

for night duty. Actually a working week of 51 hours was implied in recommendations XVII to XXI which demanded for the nurse one free day each week, a span of daily work not exceeding 13 hours, 1½ hours a day for meals, and 3 clear hours off duty independent of meal-times. In the evidence received by THE LANCET Commission from the College of Nursing and from the Association of Hospital Matrons 56 hours a week was mentioned as a maximum figure; thus the hours recommended were between those then demanded by prominent nursing organisations and those which form part of the Bill which was defeated by such a narrow majority. THE LANCET Commissioners said elsewhere (p. 93 of the final report): "We are often reminded that nurses under the living-in system waste no time or energy going to and from their work, and, taking this into consideration, a net duty basis (duty being defined as in para. 165 (*b*) above) of eight to eight and a half hours appears to us reasonable." The parenthesis refers to the wide differences in methods of reckoning hours of work or leisure which makes it difficult to compare the practice of hospitals in this respect. THE LANCET Commissioners made it clear that they did not favour the legal enforcement of an eight-hour day, since emergencies must arise in any service connected with the sick which would render impossible any rigid adherence to fixed hours of work. But for this very reason they held a maximum working day for normal routine to be of the utmost importance. In the course of the debate many questions of vital moment arose and those interested in the nursing problem should not fail to study the official report of the debate.

THE THORACIC SURGEON

IN the first 2½ years of its existence the department of thoracic surgery at the Newcastle General Hospital treated 174 cases and performed 340 operations. The mathematician will notice that this means an average of almost 2 operations per patient. Not only are many of the remedial operations for chest diseases carried out in stages, but often they have to be preceded by investigations, such as bronchoscopy, œsophagoscopy, and thoracoscopy, which are operations in themselves. Patients requiring major surgery of the chest usually stay in hospital at least three or four months, and the average for all the cases admitted to the department was 66 days. On this text Mr. George Mason, the surgeon-in-charge, makes some significant remarks about the way in which care of this kind can be provided.[1] He begins by pointing to the advantage of a thoracic surgery clinic being closely associated with the tuberculosis dispensary system, this association being most easily effected when the clinic is at a municipal hospital, as at Newcastle. More important however is the fact that, in the provinces at any rate, it is usually impossible for a thoracic surgeon to make a satisfactory living by private practice; so that, unlike other specialists, he is seldom in a position to accept an unpaid post at a voluntary hospital. The private practice of thoracic surgery does not pay, because an unusually high proportion of the patients are poor, because (as we have seen) they need prolonged care, and because only the wealthy can bear the cost of repeated radiological and other investigations—let alone find a fee for the surgeon. The latter, Mr. Mason concludes, must therefore be subsidised directly by the public authorities of the district where he works, and arrangements should be made for several authorities to use his highly specialised services both at his central clinic and, where necessary, at their sanatoriums. The most useful contribution he can make towards the work of the voluntary hospitals is to consult with their staff and transfer appropriate cases to his own care at the municipal hospital if need be. The brilliant results that advanced specialism can give in this branch of medicine are evident not only from Mr. Mason's own report and his Hunterian lecture on extirpation of the lung[2] but also from the addresses to the West London Medico-Chirurgical Society which we describe on p. 1377.

[1] City and County of Newcastle-upon-Tyne: Newcastle General Hospital: Report on work of Dept. of Thoracic Surgery, 1934–36.

MEDICAL DIRECTORY 1938

WE received on Dec. 6th the Medical Directory for 1938 which contains not far short of 60,000 names. Last year attention was called to the fact that the list of practitioners in the London section had practically ceased to grow. The stasis it seems was temporary, for this year each of the seven sections of the directory shows a substantial increase, not excepting Ireland and the Services. Were it not, in fact, for the turn of the tide of medical students revealed by a study of the Registers[3] there might have been some anxiety as to where this increase was leading. Apart from the 40 extra pages in the directory occasioned by this increase there is no substantial change in the well-accustomed form in which the information is presented. We suspect, however, that the appeal for accuracy which we endorsed when the yearly inquiries were being sent out[4] has borne some fruit, for the sinister entry "Address uncommunicated" appears but rarely. It should be regarded as a friendly act for every member of the medical profession to make the record as timely and accurate as is possible. This is the ninety-fourth annual issue and it may be had from Messrs. J. and A. Churchill at the price of 36*s*.

THE second Darling foundation prize of the League of Nations has been awarded to Prof. N. H. Swellengrebel, of the chair of tropical parasitology, Amsterdam. The prize will be presented to him during the third International Congress on Malariology which is being held in Amsterdam in September, 1938. The prize is awarded for original work on malaria published during the previous five years, and the first recipient was Colonel S. P. James, F.R.S.

[2] *Lancet*, 1936, **1**, 1047. [3] See *Lancet*, 1937, **1**, 641.
[4] *Ibid*, August 21st, p. 456.

HOSPITAL SAVING ASSOCIATION.—The annual meeting of group representatives of the association took place on Dec. 1st at the Kingsway Hall when the chairman, Sir Alan Anderson, announced an increase of 123,000 in the number of contributors and of £83,000 in contributory income. At the end of July the total number of contributors was 1,778,236, and during the year £1,004,000 had been collected. There was a gap between the sum they were able to pay the hospitals out of the pooled weekly threepences of the workers and the high costs of the hospital treatment given in return. They wanted employers to help to bridge this gap by adding 1*d*. a week to their employees' 3*d*. The new item of "employers' contributions" on this year's records showed that a start had been made. Sir Alan mentioned that St. Thomas's Hospital, which has stood outside the scheme from its inception, would become a coöperating hospital next year. Reciprocal arrangements with other contributory schemes throughout the country were growing steadily, and the arrangement by which consultations with specialists are available upon special terms would be extended beyond the County of London to the metropolitan police area.

SPECIAL ARTICLES

THE INFLUENCE OF ANÆMIA AND POOR SOCIAL CIRCUMSTANCES DURING PREGNANCY ON SUBSEQUENT HISTORY OF MOTHER AND CHILD

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In our first investigation [1] the hæmoglobin level was estimated in 1108 pregnant women who attended the Stockport corporation antenatal clinics. The Haldane method was used. The patients were divided into two groups according to their social circumstances:—

Group I.—Those with an average net income (after deduction of rent) of 12*s.* per head per week or less.

Group II.—Those with an average net income of over 12*s.* per head per week.

It was found that 10·2 per cent. of them gave a hæmoglobin reading below 70 per cent., that the anæmia was always hypochromic, and that the incidence of anæmia was higher where the family income was low. It is proposed in this paper to try to assess the influence of the anæmia and the social circumstances during pregnancy on the subsequent history of mother and child.

For various reasons it was not possible to follow up 14 cases (9 primiparæ and 5 multiparæ). The present series, therefore, consists of 1094 women (431 primiparæ and 663 multiparæ). Of these 702 were in Social Group I and 392 were in Social Group II.

THE FINDINGS

Incidence of toxæmic symptoms in pregnancy.—The number of women who showed toxæmic symptoms during pregnancy was 142. Of these 69 were primiparæ and 73 were multiparæ; 84 were in Social Group I and 58 were in Social Group II. The percentage of those with toxæmic symptoms in each group and sub-group is shown in Table I.

TABLE I

Incidence of Toxæmic Symptoms in Pregnancy

—		No. in group.	Hb. < 70 %.	Toxæmia %.	
				Whole group.	Hb. < 70 %.
Whole group		1094	111	13·0	15·3
Primip.	Total	431	25	16·0	20·0
	S.G. I	208	15	15·9	20·0
	„ II	223	10	16·1	20·0
Multip.	Total	663	86	11·0	14·0
	S.G. I	494	76	10·3	14·5
	„ II	169	10	13·0	10·0

Primip. = primiparæ. Multip. = multiparæ. S.G. = social group.

Neither anæmia nor poor social circumstances appeared to have influence on the incidence of toxæmic symptoms in pregnancy.

[1] *Lancet*, 1937, **1**, 43.

Incidence of abnormal labour.—Only those women with normal measurements, normal presentation, and a normal pregnancy, apart from the anæmia, were included in this group. The group consists of 876 women (336 primiparæ and 540 multiparæ). Of these 570 were in Social Group I and 306 were in Social Group II. The percentage of abnormal labours in each group is set out in Table II.

Abnormal labour is taken to mean one in which the woman was unable to deliver herself by natural forces, had retained placenta or membrane, or had undue hæmorrhage during or following the confinement.

TABLE II

Incidence of Abnormal Labour

—		No. in group.	Hb. < 70 %.	Abnormal labour %.	
				Whole group.	Hb. < 70 %.
Whole group		876	77	15·5	10·4
Primip.	Total	336	18	25·6	27·7
	S.G. I	164	11	25·9	27·3
	„ II	172	7	25·1	28·6
Multip.	Total	540	59	9·2	5·1
	S.G. I	406	50	8·8	6·0
	„ II	134	9	10·4	Nil.

There appears to be at least as great a proportion of abnormal labours among the women of Social Group II as among the women of Social Group I. Anæmia does not seem to have any bearing on the percentage of abnormal labour.

Number of maternal deaths.—There was 1 maternal death in the series of 1094 women. The cause of death was placenta prævia. The woman was a 5-para in Social Group II, and her hæmoglobin level was 72 per cent.

TABLE III

Incidence of Puerperal Pyrexia

—		Number of cases.		Pyrexia notified %.	
		Total.	Hb. < 70 %.	Total.	Hb. < 70 %.
Whole group		730	69	2·3	4·3
Primip.	Total	250	13	4·0	7·7
	S.G. I	122	8	4·1	Nil.
	„ II	128	5	3·9	20·0
Multip.	Total	480	56	1·7	3·6
	S.G. I	360	47	1·7	2·1
	„ II	120	9	1·7	11·1

Incidence of puerperal pyrexia.—Only those women with a normal pregnancy, apart from the anæmia, and a normal labour were considered. The total number in this group was 730 (250 primiparæ and 480 multiparæ). Of these 482 were in Social Group I and 248 in Social Group II. No notification of puerperal fever was received, and there were 18 notifications of puerperal pyrexia in respect of these 730 women. Of these 10 related to primiparæ and 8 to multiparæ; 11 of the women were in Social Group I and 7 were in Social Group II. The percentage of pyrexia notified is shown in Table III.

It is possible that anæmia may have some slight influence on the incidence of puerperal pyrexia. Social circumstances have no influence.

Effect on duration of labour and weight of child.—Some of the women were confined in the corporation maternity home, where it was possible to make

TABLE IV

Duration of Labour and Birth Weight of Child

—	No. of cases.			Average duration (mins.).						Aver. birth weight of child (oz.).		
		Hb. %		2nd stage.			3rd stage.				Hb. %	
	Total.	86 +	70–84	Total.	86 +	70–84	Total.	86 +	70–84	Total.	86 +	70–84
Whole group	157	87	70	76	91	63	19	15	19	119	117	119
Primip.—												
Total ..	85	55	30	104	108	98	19	15	21	115	115	114
S.G. I ..	18	11	7	94	79	138	19	14	25	113	115	98
„ II ..	67	44	23	108	115	92	19	16	20	116	114	117
Multip.—												
Total ..	72	32	40	38	39	44	17	15	18	123	118	124
S.G. I ..	42	18	24	31	32	30	16	14	17	124	126	122
„ II ..	30	14	16	48	49	47	19	15	20	123	107	126

accurate observations on the duration of the second and third stages of labour and the weight of the child at birth. Among the 159 women confined in this home who gave a history of normal pregnancy and delivery by natural forces, only 2 had a hæmoglobin reading below 70 per cent., 70 were between 70 and 84 per cent., and 87 gave a reading of 86 per cent. and over. The two cases giving the reading below 70 per cent. were discarded, and the two groups of 70 cases between 70 and 84 per cent. of hæmoglobin, and 87 cases with a hæmoglobin reading of 86 per

TABLE V

Stillbirth Rate per 1000 Live and Still Births

—	No. of women in group.	Hb. < 70 %.	Stillbirth rate.	
			Whole group.	Hb. < 70 %.
Whole group	876	77	22·8	26·0
Primip. .. Total ..	336	18	20·6	111·1
Primip. .. S.G. I ..	164	11	24·4	90·9
Primip. .. „ II ..	172	7	17·0	142·8
Multip. .. Total ..	540	59	24·1	Nil.
Multip. .. S.G. I ..	406	50	24·6	„
Multip. .. „ II ..	134	9	23·4	„

cent. and over were compared. Of these 85 were primiparæ and 72 were multiparæ; 60 were in Social Group I and 97 in Social Group II.

The average duration of the second and third stages of labour and the average birth weight of the child is shown in Table IV.

Neither anæmia nor social circumstances appeared to have any influence on the duration of labour or the birth weight of the child.

Influence on the stillbirth rate.—In this group only those women with normal measurements, a normal presentation, and a normal pregnancy apart from the anæmia were considered. The 876 labours resulted in 856 live births and 20 stillbirths. Of these 570 were in Social Group I and 306 in Social Group II; 336 were primiparæ and 540 were multiparæ. The stillbirth rate in the two sub-groups is shown in Table V.

Anæmia appears to have some slight influence on the stillbirth rate among the primiparæ. Social circumstances do not appear to have any influence on the stillbirth rate.

Influence on neonatal and infant death-rates.—Of the 1057 live births, there was no information after birth in 51 cases. A group of 1006 remained. Of these 730 had a normal pregnancy apart from the anæmia, and a normal labour and puerperium. These only were considered in this group. Of the 730, 250 were primiparæ and 480 were multiparæ; 482 were in Social Group I and 248 were in Social Group II. The neonatal and infant death-rates are shown in Table VI. The neonatal death-rate is calculated on the number of deaths occurring in the first four weeks

TABLE VI

Neonatal and Infant Death-rates per 1000 Live Births

—	No. of women in group.	Hb. < 70 %.	Neonatal death-rate.		Infant death-rate.	
			Whole group.	Hb. < 70 %.	Whole group.	Hb. < 70 %.
Whole group ..	730	69	10·0	45·4	47·1	106·1
Primip. Total ..	250	13	8·8	90·9	48·2	90·9
Primip. S.G. I ..	122	8	17·7	143·0	44·2	143·0
Primip. „ II ..	128	5	Nil.	Nil.	52·1	Nil.
Multip. Total ..	480	56	10·6	36·3	46·5	109·1
Multip. S.G. I ..	360	47	11·3	43·4	50·6	86·8
Multip. „ II ..	120	9	8·5	Nil.	34·1	222·2

of life per 1000 live births, and the infant death-rate on the number of deaths under twelve months per 1000 live births.

Severe anæmia combined with poor social circumstances in the pregnant woman appear to have a definite influence on both the neonatal and infant death-rates.

Influence on breast-feeding.—Particulars of the feeding of the child were obtainable in 930 cases. Of these 353 were primiparæ and 577 were multi-

TABLE VII—*Breast-feeding*

—	No. in group.	Hb. < 70 %.	Percentage.			
			Breast nil.		Breast over 6 months.	
			Whole group.	Hb. < 70 %.	Whole group.	Hb. < 70 %.
Whole group ..	930	91	5·5	4·4	32·2	23·1
Primip. Total ..	353	18	5·1	5·6	27·2	16·7
Primip. S.G. I ..	172	12	5·2	8·3	20·9	Nil.
Primip. „ II ..	181	6	4·9	Nil	31·4	50·0
Multip. Total ..	577	73	5·8	4·1	35·3	24·6
Multip. S.G. I ..	429	65	5·1	4·6	33·8	23·1
Multip. „ II ..	148	8	7·4	Nil.	39·2	37·5

paræ; 601 were in Social Group I and 329 were in Social Group II. The percentage of those totally unable to breast-feed, and the percentage of those who were able to breast-feed longer than six months is shown in Table VII.

The percentage of those women who failed to breast-feed was almost the same for women who had a hæmoglobin reading below 70 as for the group as a whole. Neither did social circumstances seem to have much bearing. On the other hand, when breast-feeding was actually established, the proportion of women with a hæmoglobin reading of under 70 per

cent. who were able to continue to breast-feed for at least six months was definitely less than when the group was considered as a whole. When the numbers are divided into social groups it is found that the difference is almost entirely confined to Social Group I.

TABLE VIII

No Illness in First Year

—		No. in group.	Hb. < 70 %.	No illness %.	
				Whole group.	Hb. < 70 %.
Whole group		856	88	60·2	42·0
Primip.	Total	308	17	72·1	58·8
	S.G. I	148	12	62·8	50·0
	,, II	160	5	80·6	80·0
Multip.	Total	548	71	53·5	38·0
	S.G. I	406	64	49·0	34·4
	,, II	142	7	66·2	71·4

Influence on the amount of illness in the child's first year.—Information as to the amount of illness in the first year was obtainable in a series of 856 children, 308 of whom were the children of primiparæ and 548 the children of multiparæ. Of their mothers 554 were in Social Group I during pregnancy and 302 in Social Group II. The percentage of children in each sub-group who had no illness during the first year is shown in Table VIII.

There was a greater freedom from illness among the children of women in Social Group II than among the children of those in Social Group I. In Social Group II there was very little difference in the amount of illness among the children of the women who had a hæmoglobin reading under 70 per cent. compared with the group as a whole. In Social Group I, however, there was a greater amount of sickness among the children of those women with a hæmoglobin reading below 70 per cent. than among the children of those women with a higher hæmoglobin reading.

Severe anæmia, therefore, in the pregnant woman, combined with poor social circumstances, has a definite bearing on the amount of illness in the child's first year.

Influence on the time when the child first walked.—Only children who were breast-fed for six months and more were considered in this group. Information was obtainable in 271 cases, 77 of whom were the children of primiparæ and 194 of whom were the children of multiparæ; 175 were in Social Group I and 96 were in Social Group II. The percentage of those children who walked before the end of the first year is shown in Table IX.

It does not appear that anæmia or poor social circumstances in the mother had any effect on the time when the child first began to walk.

Influence on time when first tooth was cut.—Again only the children who were breast-fed for six months were considered. There were 334 cases in this group, of whom 103 were the children of primiparæ and 231 were the children of multiparæ; 208 were in Social Group I and 126 in Social Group II (Table IX). There seemed to be some delay in cutting the first tooth among the children of anæmic mothers. Social circumstances do not appear to have any influence.

Influence on the weight of the child.—Only children who were breast-fed for six months were considered. Information was obtainable about the weight at six months in 190 cases, of whom 63 were the children of primiparæ and 127 were the children of multiparæ; 115 were in Social Group I and 75 in Social Group II. It was possible to ascertain the weight at one year in 151 cases. Of these 52 were the children of primiparæ and 99 children of multiparæ; 90 were in Social Group I and 61 in Social Group II (Table IX).

Anæmia in the mother appears to have some influence on the weight of the child. Social circumstances in the breast-fed child do not appear to have any influence.

SUMMARY AND CONCLUSIONS

The influence of anæmia and poor social circumstances in pregnancy on the subsequent history of mother and child is reviewed in 1094 women.

The incidence of *toxæmic symptoms* in pregnancy does not appear to be influenced by anæmia or social circumstances.

Anæmia in the pregnant woman did not appear to have any influence on *abnormality in labour*. There was much the same proportion of abnormal labours

TABLE IX—INFLUENCE ON DEVELOPMENT OF CHILD

—	Whole group.							Hb. under 70 %.						
	Grand total.	Primiparæ.			Multiparæ.			Grand total.	Primiparæ.			Multiparæ.		
		Total.	S.G. I	S.G. II	Total.	S.G. I	S.G. II		Total.	S.G. I	S.G. II	Total.	S.G. I	S.G. II
Cases breast-fed at least 6 months, where information available as to—														
1. When walked	271	77	34	43	194	141	53	18	1	Nil.	1	17	15	2
2. When cut 1st tooth	344	103	41	62	241	177	64	27	3	,,	3	24	21	3
3. Weight at 6 months	190	63	25	38	127	90	37	18	2	,,	2	16	13	3
4. Weight at 1 year	151	52	21	31	99	69	30	13	2	,,	2	11	9	2
Percentage of whole group who—														
1. Walked before 1st year	54·2	42·9	44·1	41·9	59·3	59·6	58·5	50·0	100·0	,,	100·0	47·1	46·7	50·0
2. Cut 1st tooth:														
(*a*) Before 6 months	33·4	33·0	46·3	24·2	33·6	33·3	34·3	37·0	33·3	,,	33·3	37·5	33·3	66·6
(*b*) After 9 months	34·3	40·8	31·7	46·8	31·5	29·4	37·5	51·9	33·3	,,	33·3	54·2	57·1	33·3
3. Weighed 15 lb. + at 6 months	74·2	76·2	88·0	68·4	73·2	70·0	81·8	55·6	Nil.	,,	Nil.	62·5	53·8	100·0
4. Weighed 21 lb. + at 1 year	47·7	55·8	52·4	58·1	43·4	42·0	46·7	30·8	,,	,,	,,	36·4	33·3	50·0

among women of Social Group I as among women of Social Group II.

As only one maternal death occurred in the series of 1094 women, no conclusions about mortality could be drawn. Though no case of *puerperal fever* occurred in the series anæmia may have some slight influence on the incidence of puerperal pyrexia. Social circumstances have no influence.

The *duration of labour* and the *birth weight* of the child appeared to be unaffected by anæmia or social circumstance. Anæmia appeared, however, to have some slight influence on the *stillbirth rate* among the primiparæ. Social circumstances had no influence on the stillbirth rate in our series. Anæmia, combined with poor social circumstances, had a definite influence on the *neonatal death-rate* and the *infant death-rate*.

Neither anæmia nor social circumstances appeared to have much influence on the establishment of *breast-feeding*. When, however, breast-feeding was actually established, women in Social Group I, with a hæmoglobin reading of under 70 per cent., were unable to maintain breast-feeding for as long as women in better social circumstances and with a more satisfactory hæmoglobin level.

Children whose mothers were in better social circumstances during pregnancy had less *sickness during the first year* than those children whose mothers were poorer. Anæmia in these better-class mothers had no influence on the sickness rate among their children. Among the poorer mothers, however, severe anæmia during pregnancy definitely increased the sickness rate among their children.

Neither anæmia nor poor social circumstances in mothers who breast-fed their children for six months appeared to have much influence on the *time when the child first walked*. There was some delay in *cutting the first tooth* among the children of anæmic mothers. Social circumstances had no influence.

Anæmia in the pregnant woman seemed to have some slight influence on the increase of weight in breast-fed children. Poor social circumstances did not appear to have any influence.

VIENNA

(FROM OUR OWN CORRESPONDENT)

TREATMENT WITH ARTIFICIAL PYREXIA

AT one of the recent meetings of the Vienna Medical Society Prof. Pötzl spoke on artificially induced fever as a therapeutic agent. All the papers and communications published in honour of the 80th birthday of Wagner-Jauregg have shown definitely that the malaria treatment remains the method of choice. Its indications have recently been extended by its application to progressive muscular dystrophy and to acute anterior poliomyelitis. Both have already been mentioned by Wagner-Jauregg, who as long ago as 1922 reported a case of the former that was cured after an attack of typhoid fever. At present it is thought best to treat a case of progressive muscular dystrophy, following Rottmann's advice, with a mild course of fever consisting of five attacks of pyrexia. Prof. Pötzl would not extol this method because the results have not been controlled long enough, but cases under observation do seem to be favourably affected. Kauders of Graz has recommended the malaria treatment for an attack of poliomyelitis. He started the treatment rather early, 2–4 weeks after the end of the acute stage. His theoretical basis was the abnormal permeability of the barrier between blood and spinal fluid, as proved by the protracted increase of albumin in the fluid. It is known that malaria treatment promptly diminishes this permeability. But one must bear in mind that improvements often occur without any treatment. It may be mentioned that some have attempted to influence other brain conditions such as cyclothymia or temporary depressions by applying diathermy to the mesencephalon. The results, however, have been disappointing.

TREATMENT OF AURAL CONDITIONS

Recent advances in aural surgery were discussed a few weeks ago in another paper read before the Vienna Medical Society by Prof. Mayer. He emphasised the fact that an acute otitis generally attacks the entire pneumatic system of the mastoid bone. But the surgeon must know that the air cells extend into the petrous, especially into its apex. Abscess there may be followed by violent trigeminal neuralgia, owing to the vicinity of the Gasserian ganglion, and paralysis of the abducens. These abscesses may be approached either from the mastoid or via the tympanic cavity. Since the internal carotid artery interferes with the direct access to the apex, it is sometimes necessary to expose the artery in the carotid canal; this has proved to be a very useful and safe procedure. Owing to the vicinity of the apex to the sphenoid cavity and to the nasopharynx abscesses not infrequently break through into these parts, thus producing a natural healing. Surgeons have also attempted to relieve non-suppurative chronic conditions such as progressive catarrhal deafness and otosclerosis. To make a new opening for sounds instead of the sclerosed oval window, which hitherto has resisted surgery, Passow has tried the promontory, while Barany, Holmgren, and Sourdille have chosen other parts of the osseous labyrinth. It is remarkable what little reaction is caused by these operations on the uninflamed labyrinthine capsule; meningitis need not be feared. But it must be admitted that up till now the results have been poor and improvement was only temporary. Experimental research is going on in these problems and some satisfactory observations have been made by different authors working with hormones and with short waves.

COMING POST-GRADUATE LECTURES

Besides the new semester for students who have not yet graduated, a series of lectures for qualified men has been arranged, which will be delivered by the chiefs and assistants of the various clinics and hospital departments. Each of these classes comprises ten to twenty lectures, lasting 2–4 weeks. These classes will be delivered on certain chapters of medicine and surgery, mostly in German, but some also in English, if a minimum number (10) apply for it. The intention is to give a complete review of the development and the latest achievements in this special discipline, so that the student is brought up to date. The classes will be both practical and theoretical. Vienna has been frequented for the last few months by quite a number of men from abroad, amongst them American, Indian, Egyptian doctors, also men from Central Asia, South Africa, and South America. There is no restriction on the influx of foreign doctors desiring to obtain post-graduate instruction, but the university authorities desire to restrain the influx of new beginners, because the means of accommodating them in the laboratories and anatomical theatres at their disposal has become lately very limited. As an illustration of these

conditions may be taken the fact that a number of students passed the night in front of the anatomical institute in order to obtain in the morning good places on the day of the opening of the new winter term.

A NEW LECTURER IN HYGIENE

Prof. Max Eugling has succeeded Prof. Grassberger as chief of the Institute of Hygiene of Vienna University, where he has been assistant for the last 30 years. He is well known for his climatic and hydrologic researches, and it was for this reason that soon after the war he established in Macedonia an up-to-date hygienic service.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

A HOSTEL AND POST-GRADUATE FELLOWSHIPS AT ABERDEEN

A PROJECT is under discussion at Aberdeen to start a hostel to enable medical students to live at the Royal Infirmary for three or four months in their final year. For this purpose it would have to accommodate 30 or 40 students at a time.

The full income of the A. W. Garden fund is now to be used for establishing fellowships in medicine. Their value will be not less than £200 a year and they are tenable for three to five years; they are open to medical graduates of any British University, though preference will be given to those of Aberdeen. The revenue of the Fund is about £1400.

TOXIC GOITRE

In a Honyman Gillespie lecture delivered to post-graduates last week, Dr. John Eason spoke on primary toxic goitre. He said that psychic trauma is an important activating factor in many cases, especially if the individual had a worrying disposition. Joll maintained that if traumatic shock is a potent factor, the incidence of the disease should have increased during the late war, and quotes the death-rate from toxic goitre during 1914–19 to disprove this. Dr. Eason pointed out, however, that since death does not take place for a number of years after the onset of the condition there must be a lag in the rise of the death-rate, and that since 1920 the rate has risen steadily each year. It is improbable that an emotional stimulus severe enough to produce the syndrome does so by direct action on the thyroid gland. He suggested that the immediate effect of psychic trauma, after a brief period of pallor, is flushing, pulse acceleration, palpitation of the heart, and throbbing in the neck. This circulatory energy affects mainly the organs nearest to the heart, such as the thyroid, thymus, and parathyroids, and leads to their over-activity. In support of this view, Dr. Eason stated that the thymus is often found to be enlarged, and there is loss of calcium in the urine and decalcification of bone in cases of hyperthyroidism. The administration of iodine is an indispensable pre-operative measure, and its maximal effect is produced in 10–12 days. Its value in conservative treatment is more difficult to assess. It has usually been assumed that the action of iodine in hyperthyroidism is on the gland itself. Dr. Eason suggested, however, that this may not be so, and that the action may be a general effect producing a quieter circulation, and diminished blood-supply to all the tissues, including the thyroid gland. It has been shown, he said, that iodine has this effect in simple or paroxysmal tachycardia.

THE BATH CONFERENCE

DEC. 3RD–5TH, 1937

THE week-end conference of the British Health Resorts Association opened very properly with a banquet on the Friday evening in the beautiful Guildhall, when the deputy mayor, Mr. W. F. LONG, welcomed some 80 delegates to Bath. After dinner Dr. F. G. THOMSON said, "I believe in all essential respects that British spas are equal to continental spas," and therewith put an end to the Association's early (and questionable) policy of pushing the use of British spas on patriotic grounds. Admitting that their amenities are "quite reasonably good," let us now, Dr. Thomson went on, concentrate more on the medical aspect. At present the medical student is taught nothing about hydrology; the rank and file of the medical profession has no experience of it—only vague ideas of something unorthodox and a little suspect. Cannot British spas start a new epoch by combining in an elaborate series of investigations into the physiological properties of mineral waters? Such work could only be done by workers of proved capacity; it will be long, tedious, difficult, costly, and should be published under the ægis of the Association. And Lord HORDER, in a graceful tribute to the city of Bath, asserted that all our health resorts have their contribution to make—"here, now, at this juncture in our history"—to the national fitness campaign.

THE SPA AS A NATIONAL ASSET

Lord MESTON presided at the morning session on Saturday, held in the chapel of the old hospital, now the lecture hall of the Technical College. Lord HORDER, in opening the discussion, obtained the chairman's permission to widen the terms of discussion to include the health resort. Fitness, he said, is not a mere matter of physical jerks. As a nation we are supposed to take our pleasures sadly ("Aren't you enjoying your holiday? she was asked. At my age? was the reply—she was 58—but I hope I am doing my duty by Jim and the boys"); but let us get a little pleasure out of the things still left for our enjoyment. The vast spread of holiday camps bore witness to the British spirit of "health through enjoyment," which he preferred as a slogan to "health through joy." It had set free the less moneyed public from the tyranny of furnished rooms. Holiday camps must not be regarded by hoteliers as a menace; the liabilities were outweighed by their assets. If we take the larger view and cater for the whole man, then I think, he said, the spa can prove itself a valuable asset in our efforts to improve the standard of health. The intensive cultivation of the amenities will prove to be a new practice in hygiene. If you ask what I mean by the amenities, I reply—clear air to breathe; close contact with the earth and sky and sun; the sight of beautiful things and the hearing of beautiful sounds; quiet; and leisure to enjoy all these. Lord Horder finished with what he described as a little amende for his comments last year upon the British hotel, construed as stricture although really intended as a friendly nudge. I am sure, he said, that the quality of the British hotel has improved greatly ("largely because of Dr. Cox and our organisation") and to-day ranks highly amongst those institutions the world over.

Dr. G. R. P. ALDRED-BROWN followed with a careful statement of the growth of the spa and nature of

spa treatment with a hint at the untilled field of preventive medicine in which spas were employed in the care of adolescent and adult life. Especially he lamented the existence of enormous funds at the disposal of insurance societies which were not used for preventive hydrological treatment.

Dr. JAMES FENTON, chairman of the Central Council for Health Education, also insisted on the positive quality about health. What was good enough for our grandfathers should not be good enough for us; we must get rid of the idea of the British spa as something where the student pored over test-tubes and old ladies were drawn in bath-chairs. The new Act, he said, would enable a local authority to add a considerable number of physical attractions to the health resort, increasing the sense of pride in the body. Let the spas become universities of physical training, administer the rejuvenation tonic to tired workers, and not wait for muscles and joints to become stiff.

Dr. ALFRED COX uttered a plea for the tired urban man. There was, he said, little place left in the world for those that want rest and quiet. He upbraided the Ministry of Health for not being interested in the spas; abroad many of the spas were owned by the Government and grants were made for their development. Russia under the new régime had trebled its spas ("it does not do that sort of thing for fun").

Mr. HENRY LESSER, replying to Dr. Aldred-Brown, said that under the National Health Insurance scheme the additional benefits only came to some three million pounds, of which a bare £34,000 was available for spa treatment. It cost something like £3 a week to send a worker to a spa; three weeks' treatment at £3 a week worked out in terms of the capitation fee a period of twenty years. He made two practical suggestions, one that municipalities should provide free institutions, the other that there should be a direct appeal to the workers themselves.

HYDROLOGICAL METHODS

In the afternoon session, at which Col. W. BYAM, chairman of the Medical Advisory Committee, presided, Dr. F. G. THOMSON (Bath) surveyed the hydrological treatment of diseases of the joints, confining his remarks to immersion, vapour, and massage douche baths. Taking it all round, he said, the most useful bath for chronic rheumatic cases is the oldest, simplest, and least spectacular of all—namely, the deep or reclining immersion bath with undercurrent douching or manipulative exercises (during the early afternoon this method of treatment had been demonstrated at the bathing establishment). On one point he expressed himself with conviction. It is my considered opinion, he said, that no case of rheumatoid arthritis is suitable for a course of hydrological treatment so long as the slightest sign of activity still persists.

He was followed by Sir HENRY GAUVAIN, who spoke of his experience at Alton and Hayling Island (illustrated by attractive screen pictures). Most forms of surgical tuberculosis and septic conditions of the bones and joints will, he said, at some period greatly benefit by well-planned sea-bathing. But the whole success of immersion treatment depended on the ability of the patient to respond to the strong stimuli supplied; experience had now taught them not to send children to the seaside until their powers of response had been so fortified as to be capable of reacting vigorously. For, incredible as it might seem, basal metabolism was sometimes raised by a cold sea-bath to no less than 1000 per cent. above normal. At Alton hydrological treatment was limited to a special bath, cruciform in shape, and about 10 ft. long by 6 ft. wide, designed to enable attendants to supervise the exercises without needing themselves to enter the water.

Dr. W. S. C. COPEMAN divided stimuli into thermal, mechanical, and chemical, and remarked that it was the type of stimulus rather than the method of its application which was of importance. Assuming with R. F. Fox and others the existence of an underlying diathesis, predisposing to capillary spasm and stasis, treatment must extend beyond the range of the joints themselves. Hydrology, he believed, was improper for the active forms of rheumatoid arthritis. The effect of treatment was not proportional to the strength of the stimuli employed; lack of understanding of this point led too often to over-treatment. In London there was the further difficulty of the distance which the patient had to travel before and after treatment; what might be permissible in summer would often be improper in winter.

At this point the CHAIRMAN intervened to remark that little had been said about injuries and nothing about the type of water.—Dr. C. W. BUCKLEY (Buxton) offered to be frankly provocative. Obviously joint surfaces already damaged by disease must not be submitted to pressure, but hydrological treatment was definitely correct in the most acute cases (he mentioned typhoid fever as a parallel). True there was no capacity for reaction, but the joint after two or three days in plaster might have the splint removed and the patient be lifted gently into a warm aerated bath with great advantage. Massage of course did more harm than good; Robert Jones had said "never massage the knee-joint."—Dr. W. EDGECOMBE (Harrogate) said he had no doubt that water containing minerals in solution had advantage over other water in its ability to increase metabolism. There was also, he thought, less risk of exciting an unfavourable reaction with mineral water; but far more work was needed to establish this.—Dr. G. M. J. SLOT agreed with Dr. Buckley in the value of hydrological methods in the acute stage. If a journey was detrimental to the patient let him carry on the treatment at home; and why not mineralise the water artificially?—Dr. A. R. NELIGAN (Droitwich) also supported Dr. Buckley, remarking on the necessity of moving the joint through its full range once in 24 hours, and where could this be done better than in the bath? After all, the joint was but the servant of muscles which required to be kept fit. The general lack of therapeutic pools surprised him.—Dr. J. B. BURT (Bath) said that abroad the specific value of spa water was accepted as a fact; in proof whereof he cited "two simple facts": (1) the effect of mineral water in precipitating menstruation; (2) the spa crisis occurring in the middle of the second week of treatment.

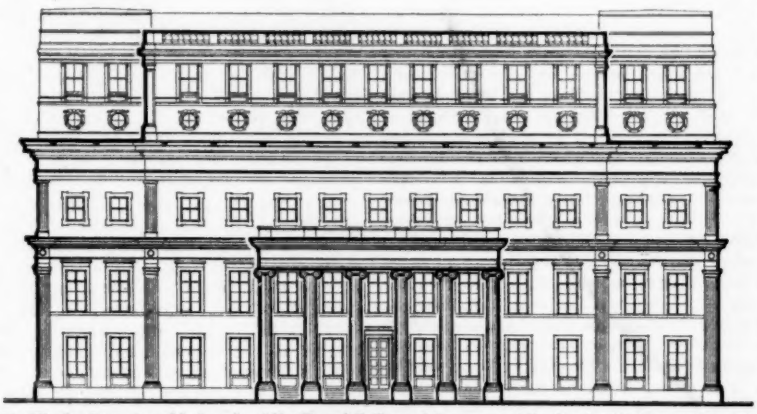
In closing the discussion the CHAIRMAN said there was widespread scepticism about the value of mineral water as such; it was up to the members of the Association to prove it if they could.

LONDON HOSPITAL.—A new department containing private wards for paying patients has been opened in Oxford-street, E., at the back of this hospital. The charges are 5 guineas a week for a bed in a two-bedded room and from 7 to 10 guineas for a separate room. There are two operating theatres attached. The general funds of the hospital are not available for this department.

OPENING OF THE BERNHARD BARON LABORATORIES

On Wednesday afternoon the EARL OF ATHLONE, chancellor of the University of London, opened the new research laboratories of the Royal College of Surgeons of England which have been constructed with a grant from the Bernhard Baron Trust. In asking the president to take over the laboratories Mr. EDWARD BARON said that on visiting the College he and his fellow trustees had been impressed by the importance of the work that was being carried out in accommodation that was quite inadequate. To-day they were impressed by the splendid use made of the grant they had felt it a duty to offer.

Sir CUTHBERT WALLACE, the president, recalled that in 1800 when the College had just moved to its present site and had received a new charter its chief preoccupation was the housing and care of the Hunterian collection. Hunter's gospel of experiment was then slowly taking root, but it was too recent to have much effect on surgical practice, and its real value was not to become apparent until Morton with ether and Simpson with chloroform abolished pain and Lister freed the surgeon's hand. It was not surprising therefore, in view of the amazing development of comparative anatomy in the first quarter of the nineteenth century, that the work of the conservators chiefly lay in that direction but they used the collection as a mine from which to extract scientific material. Richard Owen, who succeeded Clift, was a pioneer in vertebrate palæontology and concise anatomical nomenclature, and Flower followed Owen.



Sir Charles Barry's noble façade of the Royal College of Surgeons of England, with George Dance's portico, now completed by the reconditioning of the upper three floors as a research unit.

The next great phase was the development of the pathological side of Hunter's collection, by which Paget and later Samuel Shattock created in the surgeons' museum a national type collection of pathology. In 1890, with the sister college, research laboratories were established in the building on the Victoria Embankment which was erected as an examination hall. Sims Woodhead was appointed director and was followed by T. S. Brodie, but unhappily want of funds eventually closed this venture. The two Royal Colleges however turned in another direction and under their ægis in 1902 arose the Imperial Cancer Research Fund with Bashford as first director. Meanwhile the museum, under the inspiring influence of Sir Arthur Keith, had become a centre of physical anthropological research. The presidency of the late Lord Moynihan saw the old laboratories enlarged, and the inauguration of a policy bringing the College more intimately into contact with outstanding surgical problems. Then came the Buckston Browne gift of £100,000, which provided a field laboratory and bench-space for the students, who were increasing in numbers. Here, under Dr. John Beattie, valuable work had been done on surgical shock and strangulation of the bowel, the surgery of the lung, the surgical relief of disorders of the vascular system, and the functions of the hypothalamus. The very efficiency of the Buckston Browne farm made the town accommodation appear poor; but now, thanks to the Bernhard Baron trustees, there were laboratories to accommodate 30 workers, which it was hoped would enable the College to gain its desire and to advance science. "We want to create," said Sir Cuthbert, "a school of experimental surgery to train young surgeons in the technique of investigation and in scientific outlook." John Hunter's words, "Why not try the experiment?" might fittingly be inscribed on the lintel of the laboratories.

Lord ATHLONE, in opening the buildings, congratulated the council and the building committee on the use they had made of the space and funds available, and the director of research, Prof. Beattie, on the ingenious way in which he had planned his equipment. He was particularly impressed by the economical arrangement and flexibility of the laboratory units, providing for rearrangement with the minimum of expense and disturbance to meet changing requirements. He was also glad to see that the additions to the College had been made without detracting from the appearance of one of London's great public buildings; indeed, he thought that the additions designed by Messrs. Lanchester and Lodge had actually improved Sir Charles Barry's structure, with its original portico by George Dance, making a composite whole of imposing and beautiful proportions. He concluded by urging the necessity for adequate endowment to provide for those scientific men who gave their lives to research, so that they could live without financial anxiety, not only in their working days but in their years of retirement.

Sir CHARLES SHERRINGTON, O.M., proposing a vote of thanks to Lord Athlone, said that this was a significant day in the College's story toward service of the profession and community.

"There stands on the college stairway up to the library and council room a bust in marble. A face at once genial and grave. It is the face of one who, in the words of our president to-day, 'freed the hand of the surgeon.' He freed it to the extent of saving millions of lives throughout the civilised world, and suffering untold. He served on the council of our college through some of the best years of his life. Some of us can remember the calm earnest voice. He would have been radiant to-day. He would

have rejoiced that there was opened here to the young surgeon this opportunity for pursuing in the laboratory the inquiries which practical observation by the surgeon prompts. He could, I think, hardly have refrained from telling us what difficulties he had when he was young because such laboratories were not."

The great collections, finely housed and preserved within the College were justly famous the world over. But those collections with their splendid material for study offered a flood of questions, many of which could not be answered without experimentation. They were questions that recurred weekly, daily, in the sick room, in the nursing-home, in the hospital ward. "Perhaps," said Sir Charles, "I convey to Lord Athlone an impression that in opening these laboratories he has, symbolically at least, been doing nothing but opening scientific inquiries. He will, however, as representing the great university he does, feel that there is hardly a higher cause he can promote."

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CIVIL SERVANT

II

WHAT has happened to those double circles of glass, standing on three legs and enclosed in black polished wood, which in my youth were given to every scientifically minded boy—to every boy, that is, who was not conspicuously good at classics? They laid bare the secrets of the ant heap, that supreme example of the totalitarian state, and one can only suppose that they are now serving as object lessons for little Ballilas, Hitlerjugend, and Young Pioneers that whatever you do is right provided that you have been conditioned into believing that it is for the good of the State.

* * *

Deprived of these microcosms, however, it seems that in England we must search for other working models of political economy. Close to hand is the Parish Council and, in the recent parish-shaking Affair of the Drains, the council of my own village in Surrey showed so perfect an example of the merits and defects of democracy that I think it is worth putting on record. Although only 25 miles from Westminster, the village in which I live lies between two railways and off the main line of road traffic. Here men whose ancestors fought at Hastings exchange badinage in purest Surrey accents with girls whose ancestors fought at Crécy, while near me lives a woman who has never seen the sea. Consequently progress as typified by the water-carriage system of drainage has passed us by. The privy, the earth closet, and the pail closet until recently served our needs, but with the coming of main water they were supplemented by the cesspit and its more snobbish brother, the septic tank. Now in a house with a main-water supply these latter devices must inevitably overflow or leak; the builder's last act, after the Sanitary Inspector has passed by, notoriously being to kick a brick out of the wall of a cesspit with the remark "*Now* she won't give you any trouble." With plenty of land available all is well, but very soon the gardens of the cottagers became sodden with sewage and the streams polluted. Urged on by the Medical Officer of Health, the Parish Council decided that there was nothing to be done but face the large expense of installing main drainage and they called a Parish Meeting to explain matters to the electors.

* * *

It was a grand affair. Very soon it became obvious that the opposition was coming chiefly from the retired gentlefolk who got along very well at present with their adequate gardens and whose incomes would be seriously affected by a rise of over three shillings in the rates; strong objections also came from outlying parts of the scattered parish to whom the drainage system could not be extended. The bulk of the villagers and, of course, the owners of desirable building land and the shopkeepers—"Trade follows the Drain"—were solid for the scheme, and after an impassioned speech on the Fly Menace by a retired clergyman ("Beastly things, Sir, walking about with their beastly little legs all over one's forehead after luncheon . . .") a vote showed a large majority for Main Drainage. This should have ended the matter but unfortunately the Council had been convinced that the anti-drainage zealots would attend the meeting in force and out-vote them, hence they had arranged to demand a ballot and although it was clear from early in the meeting which way the vote would go, the rustic machinery once set in motion could not be easily reversed and the ballot was demanded and granted before a show of hands revealed that the prepared position in the rear was unnecessary. After a week's fierce campaign a ballot was taken and completely reversed the vote at the Parish Meeting by a large majority and main drainage seemed to be indefinitely postponed.

Nor did it end there. Emboldened by success, the leaders of the opposition raised the slogan of "Sane drainage, not main drainage!" at the next Council Election and, such is the notorious fickleness of the mob, were successful in displacing the old Council almost completely. Their victory was symbolised by the appearance in the Jubilee procession of the cesspit-emptier cart, tastefully draped with a Union Jack and drawn, to my shocked amazement, by the spirited animal on which I sometimes career on Sunday mornings over the local commons.

* * *

Months passed. One day I chanced to meet the leader of the Sane Drainers, now a conspicuous member of the Council. During a discussion on the pruning of peach-trees I idly inquired whether the new motorised cesspool-emptier was satisfactory. (This was to have acted as a "char d'assaut" in holding X—— against the main drainage attack. Ils ne passeront pas! . . .) With a marked degree of "no-enthusiasm," as Kai Lung would say, and a suggestion of a shuffling about the feet, he replied: "Of course it is difficult to know all the facts before one is In Office. Apparently there is no land available for dumping the contents of the cesspool-emptier . . . and what with one thing and another, *we have got to have main drainage after all.*"

* * *

What is the lesson to be drawn from our ants' nest? First, the village of X—— has clearly made an ass of itself. It has turned out a tried set of Councillors because they proposed something which

those who took their place found to be inevitable. But would we have been better off under some other form of government? A village Führer or commissioner or one of Cromwell's Sergeant-major Generals would perhaps have got us our drains with less fuss. On the other hand we might not have got them at all or, worse still, we might have paid for them and not got them. Drains can rouse the worst passions and even dictators cannot afford to ignore them. Was it not said that General Primo di Ribera ordered every house in Spanish towns to have a water-closet—but omitted to give any orders for the disposal of the effluent? Shortly afterwards his Government fell. But had our drains been imposed on us or denied us from above, where would have been our education in political science and self-government? Now we are Drain Conscious—and self-conscious. Now we have learnt our lesson. Or have we?

PUBLIC HEALTH

The Typhoid Outbreak in Croydon

THE total number of cases reported up to Wednesday noon is 269 (with 17 deaths). The public inquiry conducted by Mr. H. L. Murphy, K.C., was opened in Croydon town hall on Monday morning, and after preliminary discussion was adjourned for a fortnight to enable the corporation to prepare its case. Mr. Murphy said he had power to issue witness summonses but hoped it would not be necessary to use it. The adjournment was granted at the request of Mr. H. M. Pratt, representing Croydon corporation, who said that for the proper preparation and presentation of the case it was essential to have the full assistance of four very busy men, the borough engineer, the medical officer, the town clerk, and the bacteriological expert. Dr. E. V. Suckling, who has been acting in this last capacity since Nov. 11th, has stated that since that date the public water-supply of Croydon has been bacteriologically pure. Mr. Pratt said he was instructed to say that no suggestion had been made that the outbreak was in any way due to watercress. In the afternoon Mr. Murphy, accompanied by Sir Humphry Rolleston and Mr. Gourley, made a tour of the district, visiting the Addington well, a housing estate in South Croydon where sewers are being laid, and the reservoirs on Shirley Hills.

Small-pox at Hyde

We are glad to report that there have been no secondary cases following the case of variola major in an old man of 77 whose illness began on Nov. 6th; and this in spite of the fact that conditions were not quite so favourable as stated in our report last week, for the nine members of the patient's family were not all residents in his home but lived in four different houses.

Vital Statistics: a Graphic Exhibit

A recent report by G. J. Drolet, statistician to the New York Tuberculosis and Health Association, shows diagrammatically and in tabular form some of the phenomenal changes in mortality that have taken place in that city in the short course of a quarter of a century, and some of the problems that must be faced in the search for further improvement. Under the former heading may be cited the death-rate from infectious diseases in early childhood. In the years immediately prior to the Great War mortality at ages under 5 from diphtheria was annually some 200 per 100,000; in 1933–36 it varied between only 3 and 11 per 100,000. Over the same period of time the death-rate from whooping-cough has fallen from 50–80 per annum to 20–25, from measles from 100–120 to less than 20, from scarlet fever from 70–80 to 5–6. In the earlier years 400–450 children per 100,000 living died annually from these four diseases alone, in the latest years only 30–60. Infant mortality in 1910–13 was about 100 deaths per 1000 births, in 1935–36 it was a little below 50. As in our own big cities further reduction in this first year of life must come largely under the headings prematurity, birth injuries and congenital debility and malformations, and pneumonia. In the later years of childhood pneumonia and accidents take the highest toll, in adolescence and early adult life tuberculosis and heart diseases become of increasing importance. In spite of the general reduction in mortality from tuberculosis it remains in New York City the leading cause of death for males aged 20–44 and for females aged 15–24, a position which amply justifies the activities of the New York Association. The epidemic fluctuation is shown in their report for some diseases not generally notifiable in England and Wales. For instance, in a population of seven and one-third millions there were 1300–1400 cases of German measles in 1934 and 1936, and over 24,000 in 1935. In 1934 and 1936 notifications of mumps numbered 3600–4200, in 1935 they were over 9000. From less than a hundred cases in 1934 and 1936 poliomyelitis rose to 2000 cases in 1935, an epidemic prevalence from which we have fortunately been free in this country. New cases of typhoid fever number some 300 annually. To puerperal diseases are attributed 5·7 deaths per 1000 live births. With a birth-rate falling more rapidly than the death-rate the natural rate of increase of the city is now very low. Twenty-five years ago 13–14 persons were annually added to each 1000 of the total population; the corresponding figure now is only 3–4.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 27TH, 1937

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2715; diphtheria, 1830; enteric fever, 151 (31 "expected"); pneumonia (primary or influenzal), 950; puerperal pyrexia, 193; cerebro-spinal fever, 22; acute poliomyelitis, 12; acute polio-encephalitis, 4; continued fever, 1 (Paddington); dysentery, 351; ophthalmia neonatorum, 86. No case of cholera, plague, or typhus fever was notified during the week.

Of the cases of dysentery London reported 91 (of these Woolwich 21, Kensington 13, Hackney, Paddington, and Stepney each 6, Lambeth and Shoreditch each 5). Outside London the larger number of notifications came from Dorchester 28, Pewsey (Wilts) 25, Carshalton 18, Sutton 14, Enfield and Aberdare (Glam) each 13, Swansea 12, Sheffield 11, Liverpool 8, Wimbledon 7, Leyton 6, Edmonton, Hendon, Luton, Tottenham, Walthamstow, and Willesden each 5.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 3rd was 4100, which included: Scarlet fever, 931; diphtheria, 1571 (diphtheria carriers, 17); measles, 210; whooping-cough, 314; puerperal fever, 23 mothers (plus 17 babies); encephalitis lethargica, 284; poliomyelitis, 8. At St. Margaret's Hospital there were 17 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox, 8 (1) from enteric fever, 18 (0) from measles, 6 (0) from scarlet fever, 21 (7) from whooping-cough, 53 (6) from diphtheria, 46 (9) from diarrhœa and enteritis under two years, and 52 (10) from influenza. The figures in parentheses are those for London itself.

(Continued at foot of next page)

MEDICINE AND THE LAW

The Cash Value of Expectancy of Life

THE law courts continue to wrestle with the problem of interpreting in terms of pounds, shillings, and pence the damage represented by premature death. Formerly, as is well known, a common-law maxim peculiar to England ordained that a personal action died with the person. It was thus better business for a negligent motorist to kill his victim outright than merely to inflict non-fatal injuries. The Law Reform (Miscellaneous Provisions) Act altered this position by allowing the estate of the deceased person to sue for damages. Called upon to explain the working of the new principle, the House of Lords has declared that, though no sum is really adequate compensation for cutting off the normal expectancy of life, this consideration nevertheless is no excuse for shirking the task of assessment. In one of the cases under the new Act the Court of Appeal fixed the round figure of £1000 as reasonable compensation where the deceased was 23 years of age. Last week Mr. Justice Greaves-Lord, in Turbyfield *v.* G.W. Railway Co., had to deal with the death of a little girl of 8. The Court of Appeal has observed that the dead person's own appreciation of his or her lost expectancy of life is immaterial. This observation seems to standardise the values. If the rule-of-thumb figure was £1000 for death at 23, what was the judge to do about the 15 intervening years between 8 and 23? It was conceivable that the accidents of adolescence might decrease the award materially. The judge, however, declined to regard this 15-year period as a debit item. He thought that the little girl, having survived the ordeal of infantile ailments, might look forward to that period as by no means the least happy in life, with the prospect thereafter of earning her own living, entering upon marriage, and generally fulfilling the natural expectation of the human lot. Having to consider the cash value of life as "a good thing," Mr. Justice Greaves-Lord awarded the child's father £1500 for her lost expectancy of life. Lawyers who advise their clients in these matters—not excluding those who advise physicians and surgeons against whom damage is claimed for alleged negligence—have now a rough two-figure scale of values—namely, for life lost at the ages of 8 and 23 respectively.

Other elements in Turbyfield *v.* G.W. Railway Co. illustrate the extraordinary difficulty of putting a cash value upon matters of possibly subjective rather than objective nature. The dead girl, Hilda Turbyfield, and her twin sister Joyce were going home from school when the fatal accident occurred. Joyce was in front and Hilda was running after her. A horse and dray belonging to the railway company came in contact with Hilda and she was killed. The defendant company alleged contributory negligence. The court found that, in the light of the reasonable standards of the degree of care to be expected from a child of 8, the driver's negligence had been the sole cause of the accident. Hilda lived nine days after receiving her injuries. Her estate was entitled to something for her pain and suffering during that period. The parties had agreed the amount at £50. In addition the negligence of the driver had caused Joyce Turbyfield to be an unwilling witness of the accident which caused her twin sister's death. This gave Joyce a right to claim damages for the shock which she had suffered. For this item the figure of £25 damages had been agreed. Without criticising these figures of £50 and £25 as either inadequate or excessive, it is permissible to wonder what amounts a jury, or twelve different juries, would have awarded.

(Continued from previous page)

Croydon reported 6 deaths from enteric fever, London and Grimsby each 1. Liverpool had 6 fatal cases of measles, Manchester 5, Salford 2. Liverpool also reported 5 deaths from whooping-cough, Birmingham 2. Diphtheria was fatal in 29 great towns, Liverpool reporting 6 deaths, Rotherham 5, Bournemouth, Gateshead, and Birmingham each 3.

The number of stillbirths notified during the week was 255 (corresponding to a rate of 42 per 1000 total births), including 43 in London.

THE LANCET 100 YEARS AGO

December 9th, 1837, p. 388.

From a letter to the Editor from Dr. G. G. SIGMOND, *recounting his experiences with animal magnetism.*

The most remarkable case that has fallen under my observation, and which, while it excited in me great anxiety, and the deepest interest, has taught me to prosecute my researches with extreme caution, has occurred to me within the last two days. I was enjoying the hospitality of a most amiable family in Fitzroy-square, when animal magnetism became the topic of conversation, and I related the trials I had already made. One of the young ladies proposed to become the subject of experiment, to which I very willingly assented; for, having on former occasions attended her during momentary sickness, I was fully aware of the natural strength of her constitution, and the absence of that nervous temperament which renders this system totally inapplicable. I began what are technically called "the passes." They, as is not unusual, excited laughter and incredulity. I proceeded for about five minutes, and then stopped and inquired if any sensation was produced, and the answer was, "a slight sleepiness"; and ridicule was again thrown upon the subject. I recommenced the manipulations. . . . I persevered for three or four minutes, when my young friend was in the most complete trance. The stupor was most profound . . . the hands become icy cold, the face lost its natural hue, and became perfectly pallid; the extremities became quite cold; the respiration was imperceptible; the stimulus of light did not affect the eye; on speaking to her a faint smile was excited, and a quivering of the lower jaw, which seemed to indicate a wish but an incapability of answering; the pulse became gradually feebler, whilst the external appearance bore such a decidedly deathly cast that naturally some apprehension was excited amongst her family. . . . I placed the perfectly unconscious subject of this distressing scene in a horizontal position, and directed the application of warmth and of friction to the extremities. Circulation and animal heat were gradually excited, but she presented a most singular appearance of suspended animation. In this condition she remained more than four hours, for I had commenced a little after ten in the evening, and it was about half-past two, that, on some slight effort being made to rouse her, she uttered some of the most piercing shrieks I have ever heard; there were convulsive efforts to raise the limbs; the face, too, became convulsed; she opened her eyes and stared wildly around; she was placed in the upright posture, and seemed sensible. Advantage was taken of this circumstance to carry her to her apartment; before, however, she could reach it, she fell into a profound slumber, but its character was more natural. She was placed in her bed, appearing perfectly composed; the countenance had acquired its natural hue; the respiration was perfectly easy, and the pulse natural. In this state she remained during the day. . . . In the evening the young lady joined her family perfectly restored to her wonted cheerfulness. She expressed no complaint whatever. She stated that the feelings that first came over her were those of extreme quiet and repose,—a species of ecstasy—,a gradual languor seemed to steal over her; that she heard something passing around her; felt an inclination, but an utter impossibility, to reply. The first waking up she, however, described as almost terrific. It was as if she was bursting from a narrow and confined space, and as if she arose from interminable darkness.

CORRESPONDENCE

A CHRISTMAS APPEAL

To the Editor of THE LANCET

SIR,—My anxiety increases as the time for the distribution of our Christmas gifts draws near. I am indebted to many of your readers who have responded to the appeal which was made in October, but I fear that the amount subscribed to date falls far short of the sum which is needed if we are to give the much valued Christmas gift of 30*s.* to all our regular beneficiaries.

Christmas Day to all of us is a very special day; it brings back memories of happy days in the past, and all have the wish to make each Christmas Day a happy day in our own home life. I have intense sympathy for so many of our beneficiaries living in loneliness, some in one bedsitting-room, at a rental of 10*s.* a week, without relatives and without friends, and who can look only to the Fund as the society which "never forgets them" on Christmas Day.

I ask everyone who reads this last appeal not to pass it by but to send a donation, however small or large, without delay to the hon. treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, Cavendish-square, London, W.1, so that we may be in a position to give the 30*s.* Christmas gift to those who have so little of their own and who are befriended by the Fund. I am, Sir, yours faithfully,

Nov. 30th. THOS. BARLOW, President.

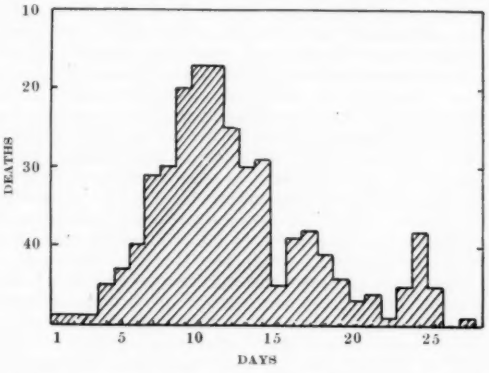
INCUBATION PERIOD OF TYPHOID

To the Editor of THE LANCET

SIR,—In relation to the epidemic of typhoid at Croydon, and to water- or milk-borne epidemics of enteric infection in general, two questions arise in which useful analogies are, perhaps, afforded by experimental observations on mice infected with *Bact. typhi-murium* (*Bact. aertrycke*).

In human epidemics in which a large number of persons are exposed to the risk of infection from polluted water or milk during a few consecutive days, and the risk is then removed by appropriate measures, it is not uncommonly assumed that, apart from contact infections, cases should cease to occur within some fixed period. If twenty-one days were allowed as the maximal probable incubation period, and seven days were added to this to allow for the definite diagnosis of a suspected case, it might be supposed that no *primary* case would be notified later than twenty-eight days after the initial risk had been removed.

Our experience with mice leads us to suspect that this assumption is ill-founded. In certain experiments that we have performed, we have records of 440 normal susceptible mice that were given by mouth doses of living *Bact. typhi-murium* varying from 100 million to 500 million bacilli. Each mouse was thereafter housed in a separate cage, with strict precautions to avoid all cross-infection. During the subsequent twenty-eight days 300 of these mice died of mouse-typhoid. The mortality in relation to time is shown in the accompanying Figure. It will be noted that the majority of deaths occurred between the seventh and fourteenth days, with a modal frequency on the tenth and eleventh days. But the curve of mortality is markedly skew, with a pronounced extension to the right, and some mice were still dying of the disease twenty-five days or more after infection. It would not be just to regard the form of the mortality curve as an accurate reflexion of variations in the incubation period, since it will be determined, in part at least, by differences in length of illness before death occurs. We think, however, that some part of the skewness is almost certainly due to variations in incubation time. For one thing, it is very unusual for a mouse to show any signs of



illness for more than one or two days before its death. For another, as we emphasise below, we have ample evidence that a high proportion of the mice that survive in apparent health for twenty-eight days are still harbouring the causative organism in their tissues.

Additional evidence, pointing in the same direction, is afforded by the findings obtained in another experiment. In this experiment several hundred mice were submitted, for various periods, to the risk of contact infection in a herd in which mouse-typhoid was epidemic, and were then removed and kept in isolation in separate cages for sixty days. This longer period of observation enabled us to note that a small number of mice died of mouse-typhoid after being removed from all risk of infection for periods of thirty to forty-six days, and after remaining in apparent health for almost the whole of this period.

It seems to us probable that the average incubation time, and the average time between infection and death in those that die, are expressions of a modal reaction between a particular parasite and a particular host, and that this mode may be rather widely departed from in a proportion of cases, probably in relation to the size of the infecting dose received, or to variations in the natural resistance of individual hosts, or to many other factors. We have little doubt, so far as the mouse is concerned, that the skewness of the mortality curve is in part due to the fact that many mice develop an infection which displays no clinical symptoms, and which may remain latent for long periods, and eventually disappear altogether, unless it is activated by some secondary factor. Whether a mouse that dies thirty or more days after infection does so because it has been "incubating" the disease for an unusually long period, or because a latent infection has become active and lethal, it is impossible to say. The point of interest is that, when any large number of animals are infected synchronously, or within a short period of time, sickness and deaths will continue to occur for a period considerably in excess of that indicated as likely by the modal course of events. It seems to us probable that the same may be true of typhoid in man and that, *apart altogether from contact infections,*

a few cases may be expected to occur well after the time limit calculated on the basis of the customary incubation period.

There is indeed direct evidence from human epidemics that such delayed primary infections occur. From the nature of the case it is not often that contact infection can be excluded, as it can in animals kept under experimental conditions; but circumstances occasionally arise in which these conditions are at least approached. Thus J. R. Miner (*J. infect. Dis.* 1922, **31**, 296) records a water-borne typhoid epidemic at Mankato in which 21 cases occurred among persons who had only been in the city on one day. For these 21 cases the mean incubation period was 13·8 days, but in one case it was as long as 29 days. The same paper records other epidemics in which the mean incubation period was significantly longer or shorter than this, and in several of these primary cases are recorded as occurring later than the twenty-first day; but in no other instance does it seem possible to exclude contact infection with the same degree of probability as in the Mankato outbreak.

The second point concerns the possibility of contact infection from carriers, or from missed cases. We have noted above that mice killed in apparent health twenty-eight days after feeding with a large dose of *Bact. typhi-murium* are frequently found to be harbouring that organism in their tissues. Actually, in the series of experiments referred to, 140 mice were killed in apparent health on the twenty-eighth day, and *Bact. typhi-murium* was isolated from the spleens of 70. The true infection figure was certainly higher, since the presence of secondary infections sometimes makes isolation difficult. Results of a similar kind have been obtained on many thousands of mice in various other experiments. We should therefore, so far as it is permissible to argue from mice to men, expect that, in a water- or milk-borne epidemic in which large numbers of persons are exposed to infection, latent infections would be relatively common. This would mean the occurrence in the following weeks or months of a certain number of "contact" infections not traceable to any preceding case. It is probable that, here as elsewhere, the potential danger from a carrier will be closely related to the extent to which she, or he, is concerned in the preparation or handling of food. How numerous such carriers may be in relation to the number of cases we cannot guess, since, so far as we are aware, no figures are available. It is a point on which it would be interesting, and perhaps useful, to obtain some reliable data.

We are, Sir, yours faithfully,

MAJOR GREENWOOD, MARION WATSON,
W. W. C. TOPLEY, JOYCE WILSON.
London School of Hygiene and Tropical Medicine, Keppel-street, W.C., Dec. 1st.

STANDARDS OF NUTRITION

To the Editor of THE LANCET

SIR,—As one confronted weekly with the problem of assessing the "nutrition" or "nutritional state" of school-children and investigating the various conditions called "malnutrition," may I enter a late protest against the continued employment of these words in a clinical sense? I believe firmly that the present divergences of findings and the confusion surrounding the whole subject are due far more to the misuse (as I think) of these words and to the hazy thinking underlying it than to inaccuracy or prejudice of individual observers.

The word "nutrition" has, of course, long been used by physiologists to describe one of the characteristic phenomena of life—the ingestion and utilisation of foodstuffs. As a word used in parallel with "respiration" and "reproduction" no one can quarrel with it. It may also be used without danger of confusion to describe a province of science which concerns itself with alimentation—an experiment to determine the effect of changes of diet on animals or children can be called an experiment in nutrition. But when it is used clinically to describe some quality in an individual comparable to height, weight, colour, build, or posture and is assumed to be a thing measurable or referable to some standard then, I submit, the word has no connotation, no accurate meaning at all, and we do ourselves and the cause of truth great harm by employing it.

It is only too clear that it is used in widely differing senses by individual writers and speakers. Some use it as a synonym for health or "general condition." A child in perfect health has perfect nutrition, one in indifferent or poor health has indifferent or poor nutrition. No doubt this is true in a physiological sense but as the words "health" and "general condition" are unambiguous and beg no questions, why not use them?

To another school of thought almost any defect, even apart from general health, is evidence of impaired nutrition, and the existence in an otherwise healthy-seeming child of dental caries, furunculosis, postural faults, or perhaps even errors of refraction will automatically exclude him or her from the "good" or "normal" classes. Others of a more direct and less sophisticated turn of mind mean by the word something scarcely different from "bulk." "Nutrition 1" (plump or well covered), "nutrition 2" (slender), "nutrition 3" (too thin), "nutrition 4" (much too thin). This has at least the great merit of being a logical classification based on a single quality and one, within limits, measurable as a height-weight ratio. There is no word for this fatness-thinness quality and one is badly needed; but "nutrition" has too many other meanings. But to many others the word has a close and essential connexion with feeding (as indeed might be supposed from its derivation) and to these a child of good nutrition is a well-fed child and a child of poor nutrition is an ill-fed or underfed child.

There can be little doubt that by most laymen the word "malnutrition" is regarded as a euphemism for underfeeding or semi-starvation. We might well agree to use the word in this sense if the clinical manifestations of good and bad feeding were distinct and specific, but whereas it is a fair assumption that a child in excellent physical condition is, inter alia, well fed the reverse is, of course, by no means true and if we exclude specific vitamin deficiencies and actual starvation or something near it we cannot, in any given case, diagnose diet from physical examination. The clinical picture called "malnutrition" may, as every clinician knows, be due to a host of causes other than food or the lack of it, and while this is less true of a group than of an individual it is not easy, even in a group, to separate the effects of environment, way of life, and personal hygiene from those of feeding.

Is it wonderful that when the basis of classification completely eludes definition no uniformity in standards can be obtained? Could we not return this truant word to the physiologists and use for the future accepted clinical terms on whose meaning we shall all agree?—I am, Sir, yours faithfully,

LINDSEY W. BATTEN.
Lyndhurst-road, N.W., Dec. 6th.

ASSESSMENT OF PSYCHIATRIC TREATMENT

To the Editor of THE LANCET

SIR,—I have followed the controversy in your columns between Dr. Desmond Curran and Dr. Mary Luff with increasing bewilderment. Dr. Curran started by claiming for certain methods of treatment that they gave results as good as those published for cases treated by psychotherapy. He did not give any description of those "other forms of psychiatric treatment." It is obviously important for medicine as a whole that these methods should be clearly described if they are as important as Dr. Curran claims. Dr. Luff asked him two questions: (1) What exactly are his methods of treating neuroses apart from any form of psychotherapy? (2) What are his criteria for distinguishing cases suitable for such methods from those suitable for psychotherapy?

This seems a clear-cut issue, and I waited expectantly for the appearance of the rabbit out of the hat, and have only been rewarded with the red herring of "narcissism," while Dr. Luff has been promised a glass of sherry. But some of us are thirsting rather for information. I am sure Dr. Curran does not intend to be evasive, but seriously I do feel we have been treated to a display of dexterous fencing over an important issue. Many of us are deeply concerned that medical students should have skilled training in the treatment of the psychoneuroses. It is a really urgent matter. Dr. Curran claims he has an excellent plan. I am sure you would afford him as much space to explain that plan as you have given him to expound its results. In his last letter he says it is high time for him to turn to the two questions he is asked. I agree.—I am, Sir, yours faithfully,

W. LANGDON-BROWN.

Cavendish-square, W., Dec. 6th.

To the Editor of THE LANCET

SIR,—There are implications in Dr. Curran's article which go, in my opinion, deeper than the questions raised by Dr. Luff. The article contained details of the excellent results obtained in neurotic patients apparently by their mere attendance at St. George's Hospital without the application of any definite form of treatment. The pure empiricism of this manner of approach to the problem is somewhat striking, for Dr. Curran, I have no doubt, would be the first to admit that his insight into the pathological processes at work in his patients was about the same after they had improved or much improved as when he saw them first.

If results of this type are to be looked upon as sufficient, as the pragmatists perhaps will contend, they form a justification and excuse for the application of any and every kind of therapy that may contain a hope of benefit, however remote it may appear to be from accepted scientific principles. We are scarcely in a position to criticise "nature-cure" and the hundred-and-one different systems in vogue if our own methods of treatment are equally empirical. I have previously suggested that numerology would make an excellent background for a system of Pythagorean psychotherapy and perhaps we shall see before long that astrology ("what the stars foretell") will be entering the field as a rival or additional system recommended for neurotic patients.

If we are to encourage the purely empirical approach we may as well try to reduce the process to its simplest terms, and perhaps the time-honoured formula "Abracadabra" would meet the case as well as anything. But if we have in mind even a minimum definition of neurosis, be it frustration-regression-fixation, or merely suggestion, I think it would be more in accordance with the best medical practice if neurotic patients were dealt with by as rational a method of treatment as the situation will allow.

I am, Sir, yours faithfully,

Wimpole-street, W., Dec. 4th. FREDERICK DILLON.

THE FREUND TEST FOR CANCER

To the Editor of THE LANCET

SIR,—In your issue of April 3rd of this year Dr. P. N. Panton of the London Hospital reports results given by different diagnostic tests for carcinoma, including that of Freund. The Freund test was carried out at the London Hospital by a member of the staff of the Pearson Institute, Vienna, with the assistance of Dr. Hans Loewenthal of the London Hospital. The blood of 134 persons was tested, including 58 who had carcinoma, and Dr. Panton states that only 66 per cent. of correct results were obtained where the patient had cancer and 45 per cent. where he had not. Thus Dr. Panton comes to the conclusion that the Freund test has "no diagnostic value," falling far below the level that must be demanded of it.

The results obtained in London differ so widely from those obtained over many years in the metabolism laboratory at Linz, at the Pasteur Institute in Paris, and in Switzerland (Bezirksspital Zweisimmen), as well as by other authors (Plonskier), that the circumstances in which these examinations in London were made need closer discussion. The reason for their failure lies, in my opinion, in the way in which the test was carried out. I raised objections to this a year ago in letters to those doctors at the London Hospital whom I know personally and also to Dr. Loewenthal. Prof. Freund, too, did not approve of the way in which the test was applied in London: the failure was inevitable. Results obtained elsewhere under strict clinical control have been as follows:—

CARCINOMA PATIENTS		CARCINOMA-FREE PATIENTS	
Allgemeines Krankenhaus, Linz (May, 1935, to November, 1935)			
Freund's test positive	137	Freund's test positive	23
" " negative	4	" " negative	237
Total	141	Total	260
Institut Pasteur, Paris			
Freund's test positive	33	Freund's test positive	7
" " negative	0	" " negative	32
Total	33	Total	39
Allgemeines Krankenhaus, Linz (February to July, 1936)			
Freund's test positive and incomplete positive	123	Freund's test positive	196
Freund's test negative	12	" negative	1103
Total	135	Total	1299

It is much to be regretted, I think, that the unfavourable London results have found their way into the literature; for they are likely to prevent proper recognition of the Freund test, in England at least, for many years to come.

I am, Sir, yours faithfully,

Linz a.D., Austria, Nov. 6th. J. KRETZ.

*** In reply to this criticism Dr. Panton writes: "Dr. Kretz states quite correctly that he objected to the London trial of the Freund test at the outset. Prof. Freund wrote to me of his criticisms at a later date. Dr. Kretz considered that his lady technician from Linz should be given preference over Prof. Freund's lady technician from Vienna, and on this delicate point I took no side. Dr. Kretz further demanded that he should select the clinical cases

for his technician to report the results of the tests upon and to this procedure I definitely objected. The criticisms of Prof. Freund were rather general ones—that a delicate test might fail if transported to a foreign laboratory, and that the reagents used were not ideal. The first objection carries its own criticism. As to the second, the reagents were supplied from Vienna and fresh reagents which appeared perfectly satisfactory were also prepared at 'The London.' The facts of the matter are that the trial was first asked for by Mr. Pearson, founder of the institute in Vienna which bears his name and in which Prof. Freund works, that the technician was chosen by him, that the whole scheme of the trial was approved by him, and that the institute agreed to abide by the results of the trial. These results were so unsatisfactory that I do not propose to have the test repeated here."—ED. L.

SEDIMENTATION TESTS

To the Editor of THE LANCET

SIR,—In reply to Dr. Coke's letter of Nov. 27th a little further explanation seems to be required of the preference of many rheumatologists for the standard technique in estimating sedimentation-rates.

The most important point is that the reliability of the standard technique has been proved in a very large number of laboratories all over the world and in many other diseases besides rheumatism. The clinician can depend on it as an index of the activity of a disease and as a check on the progress of the case. Comparisons can be made with results usually obtained in rheumatic conditions and in other diseases. In addition, my experience with the test has been rather different from that of Dr. Coke; significant differences are found between the rates in rheumatoid and infective arthritis and a somewhat raised rate is not uncommon in some cases of osteo-arthritis.

I agree that the final explanation of the alterations in rate is not known, but it does not seem likely in this case that the reliability of the test would be increased by the removal of certain factors, the effect of which is *also* not thoroughly understood. Every alteration to the original blood introduces a possible source of error. As the standard technique reduces interference to a minimum, I think it will be preferred by many as a practical guide until the full explanation is available.

Dr. Coke has mentioned that the interaction of the red cells and the plasma is of the greatest importance and this is undoubtedly the case. It has been shown that in a normal blood the fall of the red cells does approximate in rate to that which would be predicted by hydrodynamical formulæ. In cases with a high sedimentation-rate the increase is not due to any gross change in the density of the serum but to the agglomeration of the red cells into larger clumps which fall more quickly, the cells being thus far from being merely an "indicator." This is the essential factor in raising the sedimentation-rate, and it seems rather unlikely that greater accuracy would be secured by removing the chief participant from the reaction or that an inert chemical substance would react in anything like the same way.

It is possible, of course, that such a precipitation of a chemical in serum might yield valuable results, but it is somewhat misleading to call it a sedimentation-rate. The burden of proof is, I think, still on the originators to show that the test corresponds in any regular manner with pathological changes in the body. I am, Sir, yours faithfully,

Harley-street, W., Dec. 3rd. C. L'ESTRANGE ORME.

IMMUNISATION AGAINST TYPHOID

To the Editor of THE LANCET

SIR,—Finding myself in complete disagreement with your views on typhoid vaccination as expressed in *The Lancet* of Dec. 4th, and in general agreement with those expressed by the *British Medical Journal* of the same date, I venture to invite you to provide for the benefit of all of us, lay and medical, some evidence differing in kind from that on which you hang the thesis that the "negative phase" is a contra-indication to inoculation after exposure on the ground that a disastrous summation of effect may ensue.

The evidence we want, if it is to impress us, must be derived from actual experiences of the sort you postulate, in the course of vaccination of human beings carried out in the face of isolated or "explosive" outbreaks of whatever origin. The literature, I may add, abounds in records of epidemics of this character where vaccination of exposed persons has been put in force as a measure of control.

The introduction of any antigen into the body certainly lowers for a brief period the specific antibody for that antigen in the circulating blood, when, for example, we give a horse a dose of diphtheria toxin. The precise mechanism of this reduction is not known, but there is general agreement that it presents no obstacle whatever to prophylactic vaccination as ordinarily practised. The circumstances of the incubation period admittedly differ from those of the pre-exposure stage, but I would meet this difference simply by reducing the doses of vaccine and shortening the intervals between them, with the object of raising the specific antibody-content of the blood to useful levels in the shortest possible time. Though the peak of antibody-formation in response to a single dose of vaccine may not be reached before the tenth day, its rise and progress can be demonstrated from a very early period, as every immunologist knows. It is a common practice indeed to immunise the horse with diphtheria toxin by doubling the dose every second day. If I inadvertently swallow typhoid bacilli to-day, is there really "a consensus of opinion" that it would be a "highly undesirable procedure" for me to vaccinate myself? If there is, I propose to ignore it and to prepare my defence as best I can while there is time to develop it. I would probably also give myself a dose of antityphoid serum to add to that defence and if, in spite of these precautions, I found myself infected, I should promptly demand more of this serum for the therapeutic effect it is most likely to exert when given early and in adequate dosage.

When a case has just been diagnosed there may be a real risk of other members of the household exhibiting symptoms within a matter of a few days, having been exposed at the same time presumably to the same infective source. In such cases the use of prophylactic antityphoid serum would seem to be strongly indicated.

Would you withhold typhoid vaccination from staff, nurses, and general entourage of fever hospitals where cases of typhoid are being treated, possibly for the first time, on the ground that they are already exposed persons and that some or all may be incubating the disease? Surely not.

Reading between the lines of your leading article I can see the writer pins his faith at all times and doubtless with justice on "our highly developed sanitary services," and he would appear to be only mildly interested in typhoid vaccination as a measure

of control even under the optimal conditions postulated by him for any effective action it may possess. With the knotty problem of assessing the achievements of antityphoid vaccination I am not here concerned. My interest at the moment is with the victims of a breakdown in any sanitary service leading to what is called, but really never is, a truly explosive outbreak mathematically confined to consumers of an incriminated article of food or drink and readily and quickly brought to an end by energetic sanitary action.

It seems to me only fair that these potential victims should receive at the earliest possible moment what benefit may accrue to them from typhoid inoculation, being, as it is, the one specific control measure we possess, and I submit that you have yet to prove that such measure will do more harm than good.

I am, Sir, yours faithfully,

Lister Institute, Dec. 7th. J. C. G. LEDINGHAM.

*** Sir John Ledingham asks for information on certain specified points and raises many others. He will not, we think, expect a detailed and documented reply at this stage, nor object if we ask him to define more closely certain of the points at issue. We are sure he does not mean, by the wording of his main demand for further evidence, that he refuses to accept guidance in prophylactic or therapeutic immunisation in man from experimental results obtained in animals, or that, if such animal experiments suggest that a particular procedure is likely to be harmful, it is unjustifiable to take notice of the fact until the harmfulness has been clearly established by extensive trials *in corpore humano*. His meaning, we take it, is that it is unwise to rely too much on analogy, and that the only final test of whether, for instance, vaccination during the incubation period of typhoid fever is, on balance, harmful or beneficial is to see what actually happens. We should agree with him, with the proviso that, where experimental results had indicated a possible element of danger, we should require very definite evidence that these results were misleading, or counterbalanced by other effects, before we recommended this particular method for general use. As Sir John states, there are many records of vaccination during epidemics; but he will probably agree that most of these records are not of a kind that allow of any clear comparison between the incidence rates among those vaccinated and unvaccinated at particular periods after exposure to infection. And we would emphasise in this connexion that we were writing in direct relation to recent events at Croydon, and specifically of persons who had been exposed to a short-term risk over a known period of time. We stated that the "negative phase" did not, in our opinion, contra-indicate the vaccination of uninfected persons in presence of an epidemic, though we doubted its usefulness in this particular case in view of the relative slightness, and short duration, of the risk to those not primarily infected.

It seems that Sir John shares our apprehension in regard to the possible, if problematical, effects of the injection of the customary large prophylactic dose of typhoid vaccine during the incubation period, since he advocates reducing the doses of vaccine and shortening the period between them. Whether he has adequate records in regard to the actual effect of such a modified prophylactic method in epidemics of typhoid fever he does not say. His views as to the possible usefulness of an antityphoid serum are even closer to our own. He asks a crucial question when he discusses the procedure he would follow if he inadvertently swallowed a dose of typhoid bacilli. We note that he would not only vaccinate himself but would probably also give himself a dose of antityphoid serum; and that, if in spite of these precautions, he found himself infected, he would promptly demand more serum for the therapeutic effect it is most likely to exert when given early and in large doses. Our own procedure would differ from his only in that, on the present balance of evidence, we should omit the injection of vaccine. He amplifies this personal acceptance of the procedure we suggested by stating, again in agreement with ourselves, that the administration of an antityphoid serum to those exposed to the primary risk appears to be strongly indicated.

Sir John is, of course, right in assuming that we should not approve of withholding typhoid vaccination from the nursing or domestic staff of fever hospitals where cases of enteric fever are being treated. The chance that any nurse was incubating the disease at the moment of inoculation would be very low, while her exposure to risk would probably be prolonged. Nor, though we certainly pin our faith on the excellent sanitary services in this country, are we in any way uninterested in, or unmindful of, the great benefit that is conferred by prophylactic immunisation when environmental conditions allow it to exert its optimal effects. Indeed, we cannot think that Sir John's disagreement with us is nearly as complete as his opening words suggest. We hold many views in common.

Two things Sir John has demonstrated beyond question, that no didactic statement on the points at issue is as yet possible, and that their further discussion is eminently desirable. Since we hope that this discussion will take place, we may summarise the views we have already expressed, as a tentative working hypothesis which is clearly open to modification in the light of any new evidence. These are:

(1) That prophylactic active or passive immunisation against any particular disease cannot be dealt with as a problem with one general simple solution, but must be considered in relation to the actual circumstances of any given case, and particularly in relation to the nature of the risk of infection and its probable duration.

(2) That in the particular case of a water-borne or milk-borne epidemic of typhoid the circumstances are relatively unfavourable to active immunisation with an antityphoid vaccine, but very favourable to passive protection with an antityphoid serum.

(3) That, in the light of our present imperfect knowledge, the most hopeful attempt at control along immunological lines, should the Croydon experience be repeated elsewhere, is to administer specific antiserum to all those who were known to have incurred the risk of drinking the suspected water or milk.

We cannot share Sir John's view that the only evidence of value is that drawn from the records of epidemics in man, and we hope that no relevant argument from any sources will be excluded from discussion.—ED. L.

GASTROSCOPY AS AN ESTABLISHED METHOD

To the Editor of THE LANCET

SIR,—Dr. Jennings's letter in your issue of Nov. 27th, relating to the excellent editorial on gastroscopy, was as inaccurate in its criticism as it was unfortunate in its reference to a medical "racket" on gastritis. There is no doubt that gastroscopy in skilled hands is a reliable investigation. I believe, however, that nothing but harm can be done by the statement that "a high proportion of the carcinomata are prepyloric ulcers or have originated from polyadenoma en nappe,

and in such cases I believe the histological criteria of malignancy to be unreliable, and the evidence of gastroscopy to be decisive." It is notoriously difficult to decide gastroscopically whether a prepyloric ulcer is carcinomatous, but a skilled histologist can distinguish, if adequate material is submitted for section.

As regards the fact that Gutzeit, despite a prolonged follow-up, did not see carcinoma developing in an early stage, it should be pointed out that the chronic atrophic gastritis that so often gives rise to gastric carcinoma is usually a symptomless disease.

I am, Sir, yours faithfully,

P. E. THOMPSON HANCOCK.

Queen Anne-street, W., Dec. 3rd.

To the Editor of THE LANCET

SIR,—I am quite unable to verify Sir Arthur Hurst's statement in to-day's issue of THE LANCET that Korbsch, Henning, Hauser, Konjetzny, Boas, and v. Bergmann have so far changed their opinions as to agree with him on the subject of carcinoma of the stomach, or for that matter to agree with any of his stimulating but paradoxical views on gastric pathology. Sir Arthur possibly wrote his letter under the misapprehension that I am opposed to the old Virchow doctrine of an association between malignancy and chronic irritation. Nothing could be further from my thoughts. I wrote in the most emphatic terms possible "*Hurst's* views on gastritis . . . are contradicted" by gastroscopical experience.

Hurst (1937) summarised his views on carcinoma of the stomach in his recent Harveian oration as follows: "There is abundant evidence to show that in the 70 per cent. of cases with achlorhydria the carcinoma results from the malignant degeneration of chronically inflamed mucosa, *the achlorhydria being a result of the preceding gastritis and not of the carcinoma*. In the remaining 30 per cent. of cases with a normal or high acidity the evidence is equally conclusive that the carcin ma is a result of malignant degeneration of a simple ulcer" (italics mine).

The view that 30 per cent. of carcinomata develop from simple ulcer and that these are the only carcinomata to retain free HCl was, and to the best of my knowledge still is, opposed by every single authority mentioned by Hurst. References are given below; it will be found that 3–5 per cent. is a rough average of the different estimates. Orator, who put forward in 1925 the view that prepyloric ulcers are especially liable to malignant change, finds that 10–15 per cent. of carcinomata originate from ulcer. When one considers that one of Korbsch's great services to gastric pathology was to call attention to the frequency with which benign prepyloric ulcers occur and are missed by X rays, it is amazing that Hurst should cite his name in favour of a hypothesis which assumes that benign prepyloric ulcers are relatively rare and dangerous lesions.

The view that the achlorhydria of gastric carcinoma was primary and not secondary was, of course, put forward and became a subject of controversy in the eighties and nineties of the last century. Since then evidence against it has steadily accumulated. Boas, Borrmann, v. Bergmann, and Katsch, merely to quote the authors of the standard German encyclopædic works of reference on the subject, oppose the view for the following reasons:—

1. Small gastric carcinomata found incidentally in routine post-mortems on accident cases, &c., are often situated in comparatively normal mucosa.

2. The average acidity of the rare lucky cases which are diagnosed early is higher than the average of all gastric carcinomata.

3. Considering the difficulties attendant on such observations, it is not at all uncommon for free HCl to disappear in the interval between successive test-meals.

4. All severe wasting diseases tend to produce achlorhydria when associated with malnutrition and toxæmia. In gastric carcinoma this tendency is probably exaggerated by the constant stimulation and neutralisation of the acid secretion.

Two further points can now be added:—

1. Follow-up figures (see Held and Goldbloom 1937) are now available on some 1600 cases of pernicious anæmia. If those cases are excepted which die within 2–3 years of the onset of symptoms and which are probably the result of misdiagnosis, it is impossible to detect any very definite increase in the liability to gastric carcinoma.

2. It is extremely doubtful if irritants such as those cited by Hurst are capable of producing a gastritis sufficiently severe to cause achlorhydria. Atrophies of the gastric mucosa appear rather to be associated with toxæmias, deficiency syndromes, and possibly endocrine disorders.

The implication that I associate "rackets" with British medicine is not justified by anything in my letter. In fact I wrote "since the days of Hippocrates" and "in many clinics . . . especially outside England." I sincerely regret being forced to rely on continental authorities, especially as I think that geographical variation may be responsible for some of our differences of opinion. There has been however no English or American gastroscopy to speak of, and my whole argument is that if you kill or gastrectomise your patients, you will never learn if supposedly precancerous lesions lead to cancer or not.

I am, Sir, yours faithfully,

Oxford, Dec. 4th. DENYS JENNINGS.

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DISABILITY FROM PNEUMATIC DRILLS

To the Editor of THE LANCET

SIR,—I recently discussed this subject with Dr. Vossenaar, chief medical officer of the Dutch State Mines, and he kindly gave me a report of an investigation undertaken by him. Dr. Vossenaar had examined 1000 workmen who have worked for at least ten years with pneumatic machines and who were still working at the time of the investigation. Eight X ray photographs were taken of the wrist- and elbow-joints in each case. The following conditions were found among these 1000 workmen:

Necrosis	.. ..	2·8 per cent.
Chondromatosis	..	2·7 „
Arthritis deformans	..	4·3 „
Total	.. ..	9·8 „

He found also 2·6 per cent. of conditions which he considered as *trouvailles accidentelles*. Among his conclusions were:

S'il était permis d'admettre que le travail avec des outils pneumatiques exerce une influence sur certaines articulations des extrémités supérieures, il serait établi en

même temps par notre enquête, que 90% des ouvriers ont échappé à cette influence pernicieuse.

Il est toutefois certain que les affections trouvées, se recontrent aussi dans tous les groupes de la population, même chez ceux qui ne manient aucun outil pneumatique ou qui ne font aucun autre travail lourd.

De plus, les affections trouvées appartiennent à trois groupes dont on peut difficilement concevoir qu'ils puissent être rapportés à une seule cause. Une réserve toute spéciale est nécessaire principalement à l'égard de l'arthrite déformante.

On the other hand, as Dr. McLaren stated in your last issue (p. 1296), the disease is scheduled in Germany as "Erkrankungen der Muskeln, Knochen und Gelenke durch Arbeit mit Pressluftwerkzeugen."

Dr. McLaren's interesting paper is welcome as the use of pneumatic machines will increase as time goes on. I am, Sir, yours faithfully,

S. W. FISHER,
Dec. 6th. H.M. Medical Inspector of Mines.

PARLIAMENTARY INTELLIGENCE

WORKING HOURS OF HOSPITAL NURSES

IN the House of Commons on Dec. 3rd Mr. F. O. ROBERTS moved the second reading of the Local Authorities (Hours of Employment in connexion with Hospitals and Institutions) Bill. He said that many of the difficulties of those in control of hospital and institutional administration would be solved if they reduced and regularised working hours. Unless a remedy could be found for the unsatisfactory state of recruitment the acute shortage of nurses must continue, and discontent would spread. The present Bill dealt only with hospitals and institutions controlled by local authorities. It provided for a 48-hour working week for outdoor staffs, except in case of emergency, where extended work might be permitted provided the overtime rates were paid. For the indoor staffs the Bill proposed a 96-hour fortnight, again making provision for paid overtime in emergencies. The cost should not be prohibitive; some part of the obligation, if not all, should rest on the State. The evidence obtained from tests made in certain hospitals of the 48-hour week—for example the London mental hospitals, in the Leicester Mental Hospital, and the North Middlesex County Hospital, the last-named on the 8-hour shift principle—showed that the experiment had been justified. Hours of work varied in hospitals from as low as 48 to as many as 80 a week. The Bill if it became operative need not interfere with the work of the interdepartmental committee on nursing. He was informed that the measure had the full support of the great majority of workers employed in and about hospitals controlled by local authorities. At a meeting held last week 500 nurses representing over 4000 nurses employed in London hospitals passed a resolution in favour of the Bill.—Mr. MARSHALL seconded the motion. He quoted from the final report of THE LANCET Commission on Nursing published in 1932, and said that while that was not a Government inquiry it was a very important one, comprising distinguished men and women in surgery, medicine, and economics. That report did not paint a very rosy picture, and it was amazing that something was not done as a result of it. The inquiry covered 44,000 nurses, so that no one could say that it was not comprehensive or intensive enough. The report was most amazing reading on the question of hours. Taking the day span it was stated that 63 per cent. of the municipal hospitals in London and the provinces compelled their nurses to be on duty from 13 to 13¼ hours every day, and that in 23 per cent. of them the nurses had to be on duty from 13½ to 13¾ hours with perhaps two hours off duty and time for meals. In the night the report stated that in 70 per cent. of the London and provincial municipal hospitals the nurses had to be on duty for from 11½ to 12¼ hours, and in 28 per cent. of them they had to be on duty from 11 to 11¼ hours, with no free time during the night. The report stated that the lack of eagerness on the part of girls from secondary schools to train as nurses showed that adjustments were necessary unless the whole system was to break down.

Mr. ERSKINE HILL regarded the Bill as premature in view of the deliberations of the interdepartmental committee. A Bill dealing with local government hospitals would obviously have repercussions on voluntary hospitals, though these should certainly reduce the total hours of work, some of them would find this very difficult. He hoped to see before long a Bill which would deal not only with conditions and hours but with the whole question.—Major NEVEN-SPENCE hoped that reduction of hours of work could be achieved through persuasion aided perhaps by some system of periodical inspection rather than by the use of the big stick.—Mr. LANSBURY said that if this reform was right they ought to find the ways and means by which it could be carried out; perhaps by subsidising the voluntary hospitals or establishing a national medical service.—Sir FRANCIS FREMANTLE felt certain that members of the interdepartmental committee on the nursing services would be largely in agreement with the main principles of this Bill, and certainly with its ultimate general object. But they could not establish a 48-hour week in the nursing and medical services as easily as they could in the factory world. To work less than a 56-hour week would aggravate the shortage. If the Bill were passed municipalities would be bound to increase their staffs and take nurses away from the voluntary hospitals, including the cottage hospitals. This reform must be brought about gradually. The conclusion of THE LANCET Commission was that the span of work should not, as a rule, exceed 13 hours, but that if one or two days a week the span should extend to 14½ hours, which should never be exceeded, the extra time should be compensated for by extra time off duty. If that was the most up-to-date and comprehensive inquiry that had been made it was obviously necessary for the interdepartmental committee to go rather thoroughly into the matter before making more drastic recommendations, but the voluntary hospitals did not have the power of the rates behind them. The House must be quite clear whether it wished to extinguish the voluntary hospitals and have a complete municipal system. If Mr. Lansbury meant by a national service a system of national coöperation he would be with him; but if the service was to be put under local government he would hotly oppose the idea, and so would the medical and nursing professions as a whole until times changed. They must meet modern needs in regard to nursing, but they would be sacrificing an enormous asset in trying to draw girls of the highest kind into the nursing service if they were to forget the spirit of service coming down from the days of the religious houses to the present case of the great voluntary hospitals. The voluntary hospital was on trial for its life, and so was the basis of one of the noblest occupations open to men and women and that demanded the rejection of this Bill.—In the debate which followed several members on the Labour Opposition benches strongly criticised Sir Francis Fremantle's speech in view of his position as a member of the interdepartmental committee, and suggested that he should resign, or be asked to withdraw from that committee.—Mr. STOREY said he thought he was right in saying that the College of Nursing, which represented some 29,000 general-trained nurses, looked upon such legislation as this Bill as harmful to their profession. They were strongly in favour of a reduction of hours, but not of

hours standardised by legislation. They particularly condemned the proposal for extra pay for extra time on grounds that this would lower the fine tradition of British nursing. The voluntary hospitals supported the College of Nursing in regard to the improvement of nursing conditions, and were determined to reduce hours as quickly as possible.

Mr. BERNAYS, Parliamentary Secretary to the Ministry of Health, said that the practice in regard to nurses hours was unequal. Some local authorities had adopted a three-shift system for nurses and in some, for example Middlesex, a 48-hour week was actually working. Most hospitals were working longer hours, especially at night. THE LANCET Commission reported that in 50 per cent. of the hospitals the hours were from 55 to 60 per week, and in 7 per cent. the hours were more than 65 per week. That was a situation which clearly called for serious and searching examination. The London County Council employed 11,000 nurses, but that authority had not been asked for its views on this Bill. The Association of Municipal Corporations was against the Bill. The immediate imposition of a 48-hour week could not but increase the shortage of nursing recruits. To ensure the supply they had not merely to consider the question of hours, but other means of making the profession as attractive as possible, including training and education. The need for the new inquiry arose primarily out of the difficulty which had recently grown more acute of staffing hospitals. The interdepartmental committee were charged with the important duty which fell outside the findings of THE LANCET Commission, to inquire into many other fundamental questions besides hours of labour which militated against the adequate recruitment of nurses. The House would stultify itself, and embarrass the committee of inquiry if they passed the present Bill. The Government felt they were adopting a more practicable way of achieving the objects of the Bill.

The motion for the rejection of the Bill was carried by 122 to 111.

JUVENILE UNEMPLOYMENT AND MEDICAL CARE

IN the House of Commons on Dec. 2nd Mr. ERNEST BROWN, Minister of Labour, secured the second reading of the Unemployment Insurance Bill. He said that the Bill was another instalment in the improvement of our social services, and it carried out the recommendations of the National Advisory Councils on Juvenile Employment. An amendment that was to be moved on behalf of the Opposition for the rejection of the Bill began: "Whilst this House welcomes the belated recognition that many unemployed juveniles are suffering from lack of food. . . ." That phrase as it stood was liable to a good deal of misconstruction, because the National Advisory Councils did not make their statement in those terms at all. They discussed the question of under-nourished children after visiting the centres, and came to the conclusion that there was a certain number of under-nourished children. There were now in Great Britain 175 centres—139 in England and Wales, and 36 in Scotland. No one could visit any of them without being struck by the fact that the standard of the young people was very remarkable, considering that so many of the centres were in areas that had suffered badly from heavy unemployment. Yet the finding of the National Advisory Councils was that it was not true to say that the overwhelming majority of these young people suffered at all from lack of food. The Councils' statements had been confirmed by his own investigations.

The Councils had recommended three things that the Bill proposed to carry out. First, enabling powers would be given to the higher education authorities of England and Wales on lines precisely similar to those enjoyed by the elementary education authorities for the provision of meals. Secondly, in addition to giving the higher education authorities power to provide meals in the juvenile instruction centres on the same terms as those enjoyed by elementary education authorities they should also give free milk and biscuits with an appropriate grant from the Government. Thirdly, the law in Scotland should be brought into conformity with that of England and Wales so that the authorities should have the power not merely to provide medical inspection but to give medical treatment.

LABOUR REJECTS THE BILL

Mr. ARTHUR GREENWOOD moved

That, whilst this House welcomes the belated recognition that many unemployed juveniles are suffering from lack of food, it cannot assent to the second reading of a Bill which, whilst bringing within unemployment insurance certain limited classes, ignores the recommendation of the statutory committee for the inclusion of non-manual workers, and leaves upon a section of the community a national burden incurred in time of depression instead of devoting the surplus in the Unemployment Fund to raising the standard of life of the unemployed.

Certain proposals in the Bill were welcomed by the Labour opposition. He was glad that the Minister had agreed to provide meals for young people in the juvenile instruction centres. It was a recognition that there were under-nourished children in those centres. That did not, however, carry them a very long way. He had never accepted the idea that the juvenile instruction centres should be run by the Ministry of Labour. The right place for these children if there was no work for them was under the care of the educational authority. If the children had four square meals a day they would not need milk and biscuits between-whiles. Under the Bill there would be a substantial sum left for the local authorities to pay and unfortunately it was those in the most hardly hit areas who would have this new care thrust upon them. Unemployment should be a national responsibility. The amendment was not moved for shadow-fighting purposes; it was put down to challenge the whole policy of the Government in their treatment of the unemployed.

Mr. GRAHAM WHITE, speaking for the Liberal party, said the new precedent of giving free meals at the juvenile instruction centres was one that he hoped would be followed wherever necessity called for it. It was disappointing that while gamekeepers, grooms, and chauffeurs were to be brought within the insurance scheme the 400,000 black-coated, or non-manual, workers were to be left out. He hoped they would have no more Bills of this kind piecemeal, but measures that would bear in mind the necessities and competing claims of the social services as a whole.

Mr. T. SMITH said the proposal to give higher education authorities the right to provide meals for children receiving juvenile instruction was a step in the right direction, but there would be more credit to the Government if they were to tackle this question of juvenile employment in different ways. It was a scandal that in the twentieth century they should have so many juveniles out of work. If he had his way he would keep these children at school and give their parents maintenance grants.

Mr. R. J. TAYLOR said with the present rise in the cost of living the standard benefits should have been raised. He welcomed the fact that boys and girls between 14 and 16 were to receive milk and solid meals at schools, but surely the Government ought to recognise the crushing burden of public assistance on local authorities, especially in the depressed areas where they had the hard core of unemployment.—Mr. E. BROWN replied that it was possible for the Minister in cases like that to make a 100 per cent. grant.—Mr. TAYLOR said that might be so, but this Bill did not seem to say it.

Mr. LAWSON said the Minister was asking the House to swallow a very bitter pill with a certain amount of jam on it. He thought at first that there was something in some of the provisions of the Bill until

he tasted the jam, when he found it was the old-time plum and apple. The Bill did not really do much for the juveniles, but he was grateful for the small amount that it did. The purpose of the Government apparently was to see that the old barrier against giving boys and girls in the juvenile training centres some food through the local authority if they could get the necessary sanction from the doctors was removed. He had been alarmed in the last year to see the positive degeneration in many cases of the training centres. Ultimately the Government would have to come round to the idea of keeping these boys and girls at school unless there was work for them. He was astonished at the apathy on the Government benches towards the position of the black-coated workers. It was admitted that theirs was among the most lamentable parts of society in this country.

PARLIAMENTARY SECRETARY'S REPLY

Mr. BUTLER said that when he and the Minister visited the boys' club at Whitehaven and saw boxing in progress it might appear that there was no need for extra nourishment, but when they read the medical reports of some of the centres and visited them they began to appreciate the need for such provisions as were included in this Bill. With regard to the black-coated workers the Government could not deal with everything at once. The Bill indicated that the Government had taken another step on the road of social progress, but they were not satisfied, and it was not in the spirit of self-satisfaction that they asked the House to give the Bill a second reading.

The motion for the rejection was negatived by 198 votes to 118.

NOTES ON CURRENT TOPICS

IN the House of Lords on Dec. 7th the National Health Insurance (Juvenile Contributors and Young Persons) Bill passed through committee and was reported without amendment to the House.

Lord ALNESS moved the Divorce and Nullity of Marriage (Scotland) Bill which was read a second time.

QUESTION TIME

WEDNESDAY, DEC. 1ST

Typhoid among Troops in India

Sir ARNOLD WILSON asked the Secretary of State for War, whether in view of the statement made at page 92 of the Report on the Health of the Army for 1935 that 30 per cent. of all typhoid cases among troops in India occurred within six months of inoculation and that nearly every year the highest percentage of cases occurred within 12 months of inoculation, he would consider the possibility of inoculating any men who might be sent to India 12 months before they were likely to embark.—Sir V. WARRENDER, Financial Secretary to the War Office, replied: My right hon. friend is advised that inoculation 12 months prior to embarkation would not confer additional protection. The majority of cases of typhoid occur during the first 12 months of service in India among persons who do not obtain immunity by inoculation.

THURSDAY, DEC. 2ND

Silicosis in Pottery Industry

Mr. HOLLINS asked the Home Secretary whether he was aware of the alarming incidence of silicosis in the pottery industry resulting in the average of over 50 deaths per year for the past several years, in addition to a large number of certified total or partial incapacity cases; and whether he would consider making such addition to the staff of His Majesty's inspectors in Stoke-on-Trent as would make it possible for the adequate inspection of factories and mills engaged in the pottery industry, with a view to the more rigid enforcement of the Factories Act and special regulations, and the reduction of the high incidence of silicosis.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: My right hon. friend is aware of the figures, but silicosis develops slowly and the deaths now occurring in the potteries appear to be largely due to conditions which prevailed many years ago. Moreover the number of cases of disablement has substantially declined. My right hon. friend is advised that the standard of compliance with the new Regulations of 1932 has greatly improved, and that the use of harmless materials is developing. The Factory Department is however fully alive to the importance of further efforts to reduce the risk of this terrible disease, and my right hon. friend will ask the Chief Inspector to bear the point in mind in the distribution of the staff.

Seagulls and Infectious Diseases

Captain ARTHUR EVANS asked the Minister of Health if his department had carried out experiments to test the theory that diseases of various kinds might be carried by seagulls, and with what results.—Sir KINGSLEY WOOD replied: Some investigations were carried out in 1903 by the late Sir Alexander Houston at the request of the Local Government Board, but I am advised that other more recent investigations have taken place. I am sending my hon. friend particulars.

Medical Officers of Health at Local Inquiries

Sir FRANCIS FREMANTLE asked the Minister of Health whether he had considered the resolution by the Barrow-in-Furness town council deploring the action of retired medical officers of health in appearing against local authorities at inquiries held by the Ministry of Health; and whether, in the interests of public health and the rights of ratepayers, he would instruct his officers holding such inquiries to obtain the best evidence available whether from retired medical officers of health or otherwise.—Sir KINGSLEY WOOD replied: I have received a copy of the resolution referred to, which relates to inquiries held by my inspectors into orders made under the Housing Act, 1936. It is for the owners of property affected by such orders themselves to decide what evidence they should produce at an inquiry, and I have no intention of doing anything to diminish their rights in this respect.

Watercress and Typhoid Infection

Sir R. MELLER asked the Minister of Health whether, as the result of his inquiries, he could give an assurance that the watercress beds in Mitcham district were free from pollution and that the watercress obtained from these beds was fit for human consumption.

Mr. DONNER asked the Minister of Health whether, in order to allay public fear of typhoid infection which had brought the sale of watercress to a standstill, thereby threatening the whole industry with ruin, he would approach the British Broadcasting Corporation and the public press with a request that publicity should be given to the fact that there was no danger from eating watercress grown in Hampshire or other areas remote from Croydon, and that such bundles of watercress frequently bore a label indicating the place of origin.

Sir ALFRED KNOX asked the Minister of Health whether he was aware that the fear that the epidemic of typhoid might have been caused by the eating of watercress had caused serious loss to the growers of cress; and whether he could make a public statement to put matters right.—Sir KINGSLEY WOOD replied: I am aware of the statements on this matter which have been current and I am in communication with the local authority regarding the watercress beds referred to by my hon. friend the Member for Mitcham. I can assure my hon. friends that as I stated in the answer on Nov. 29th I have no evidence to suggest any connexion between the present outbreak of typhoid and the eating of watercress. I have no doubt that, in view of the widespread public interest which has been aroused, what I have said will receive full publicity. Sir NICHOLAS GRALLAN-DOYLE asked the Minister of Agriculture whether, with a view to relieving doubts as to purity, he would cause a statement to be issued as to the tests made by his department to watercress before the national mark was permitted to be applied.—Mr. RAMSBOTHAM replied: Before a watercress grower can be authorised as a packer under the National Mark Scheme an examination of the beds and a topographical

survey of the surrounding land are made; and samples of the water entering the beds from springs or artesian wells are analysed by the Government chemist to ensure that the degree of purity of the water is equal to that of drinking water. Further analyses of the water are made from time to time after authorisation.

MONDAY, DEC. 6TH

Ex-Service Men in Mental Hospitals

Mr. KELLY asked the Minister of Pensions the number of ex-Service men having treatment in mental hospitals in England, Scotland, and Wales.—Mr. H. RAMSBOTHAM replied: The number of officers, nurses, and other ranks for whose treatment in mental institutions in England, Scotland, and Wales my Department was responsible at the end of November, 1937, was 5269.

Oysters and Typhoid Infection

Mr. CRAVEN-ELLIS asked the Minister of Agriculture whether he was aware that owing to the outbreak of typhoid the demand for oysters had fallen away and the oyster industry was thereby prejudiced; if he would take steps to inform the public that it was possible to obtain certified oysters which, having been cleansed by a process approved by his department and the Ministry of Health, could be eaten without danger; and if he would take steps, in the interests of the shell fisheries as well as the public health, to make the cleansing of all oysters, mussels, and other edible molluscs which were sold for human consumption compulsory.—Mr. RAMSBOTHAM replied: With reference to the first part of the question, my right hon. friend has been informed that there has recently been a reduction in the demand for oysters and that this has been attributed to nervousness on the part of the consuming public induced by the present outbreak of typhoid, but while he cannot properly express an opinion as to the cause of this outbreak pending the result of the public inquiry which is being made, he understands that there is no evidence to suggest that it is in any way connected with the consumption of oysters or other shell-fish. As to the second part of the question, my right hon. friend's department directs attention, as opportunity offers, by means of reports, leaflets, lectures by officers of the Department and otherwise, to the existence of supplies of purified oysters and mussels and explains the methods of purification and the resulting advantages; as to the last part of the question, an immediate requirement that all molluscs intended for human consumption should be cleansed would not at present be practicable, but the subject is receiving the careful consideration of my right hon. friend's Department and the Ministry of Health.

TUESDAY, DEC. 7TH

Cerebro-spinal Fever in the Army

Mr. DAY asked the Secretary of State for War the number of cases of cerebro-spinal fever reported and admitted to hospital, from the various stations throughout Great Britain, for the 12 months ended to the last convenient date.—Mr. HORE-BELISHA replied: During the 12 months ended Nov. 30th last, the numbers of soldiers admitted to hospital on account of cerebro-spinal fever were as follows: London 8, Woolwich 4, Caterham 3, Bury (Lancs) 2, and 1 each at Aldershot, Canterbury, Halifax, Lichfield, and Preston. Three soldiers' children were also admitted, 1 each at London, Parkhurst, and Woolwich.

A Welding Accident

Mr. CHAPMAN asked the Home Secretary whether he was able to report the circumstances under which Mr. John Jamieson of 7, Overton-road, Halfway, Cambuslang, Lanarkshire, was severely injured by an explosion when welding a large petrol tank, in the employ of the Riverside Engineering Company's works in Glasgow; and whether all statutory precautions were being observed at the time of the accident.—Sir SAMUEL HOARE replied: I understand that the tank had contained sulphuric acid and it is presumed that sufficient hydrogen was generated from the diluted remains of the acid to form an explosive mixture, which ignited when welding commenced. There does not appear to have been any breach of the Factory Acts, but Section 28 (4) of the new Act of last session will require further precautions against accidents of this kind.

Small-pox Prevention

Mrs. TATE asked the Minister of Health what action was being taken by his department to meet what the Rolleston (Vaccination) Committee, in their second report in 1930, described as the urgent necessity of trying to find some means of protection against small-pox other than that of the direct introduction of a living virus into the organism.—Sir KINGSLEY WOOD replied: Experiments were carried out in 1929 and 1930 at the Freedom Research Laboratories of the London Hospital, with financial assistance from my department, to test what immunity, if any, could be produced by inactivated vaccinia virus. A report was published in the *Journal of Hygiene* for January, 1932. I am advised that, though slight immunity was produced in some cases, the results of the experiments give little assurance that solid immunity can be produced in this way.

Microscopes for Ships' Doctors

Major DOWER asked the President of the Board of Trade if he was aware that microscopes were not provided for ships' doctors on merchant ships; and in view of the recent death of Mrs. T. J. Johnson, caused by the absence of a microscope on the s.s. *California*, would he consider introducing legislation to make such provision compulsory.—Mr. OLIVER STANLEY replied: My attention has been called to the death to which my hon. friend refers and I am making inquiries in regard to it. The provision of microscopes for ships on long voyages was fully examined in consultation with the Royal Colleges of Physicians and Surgeons, the Ministry of Health, and the shipowners some years ago, when it was decided that there was not a sufficient case for making the provision of microscopes compulsory. I am having the question reviewed.

OBITUARY

ROBERT BLACK PURVES, D.S.O., M.B., F.R.C.S. Edin.

ON Friday of last week Mr. Purves, a surgeon well known in the Eastern counties, fell dead from his horse when following hounds near Lincoln. Born at Manghyr, Bengal, in 1873, the son of Lieut.-Col. H. B. Purves, I.M.S., he was educated at Epsom College and Edinburgh University, qualifying in 1895. He stayed on in Edinburgh for some time as tutor in clinical surgery and was then on the surgical staff of Tewkesbury Hospital before settling in Lincoln where he spent the rest of his life, becoming surgeon to the County Hospital and consulting surgeon to a number of other hospitals in the district. Soon after the outbreak of the late war he joined the Mediterranean Expeditionary Force with the Lincolnshire Yeomanry and was on the transport *Murcian* when attacked by a submarine, being awarded the D.S.O. for bravery in attending wounded under fire. He remained in Egypt and Palestine until 1920 with the rank of lieut.-colonel. In 1927 he was Sheriff of Lincoln. A week ago he presided at the annual dinner of the Lincoln Scottish Association of which he was president. Mr. Purves married Ethel, daughter of the late John Locke.

REGINALD L. E. DOWNER, M.D. Lond., M.C.O.G.

Dr. Downer, who died on Nov. 28th, after a long illness, was the only child of Mr. W. J. Downer, C.B., of Shrewsbury. Born in 1884, he was a foundation scholar at Highgate School before entering St. Bartholomew's Hospital with an open scholarship in science. After qualifying in 1907 he held resident appointments at Chester and was for a time in

practice at Matlock. Joining the R.A.M.C. in 1914 with the rank of temporary captain, he saw service first in France and then on a hospital ship, and on his return in 1920 he settled in Shrewsbury where he specialised in midwifery and gynæcology and was the first obstetric officer at the Royal Salop Infirmary. Always interested in ambulance work he became county commissioner and serving member of the Order of St. John. He was also for many years secretary of the local branch of the B.M.A. A large smiling person with a large hearty laugh he was well liked by all his patients. It is perhaps on the social side that he will be best remembered, for he was a fine musician, extempore pianist and singer, and his renderings of Gilbert and Sullivan made him indispensable at local medical dinners and entertainments. Debarred by increasing arthritis from active practice he still showed his interest in medical matters both professional and social. Dr. Downer married in 1913 Daphne, daughter of A. Hatton Beebe, of Esher, Surrey, and leaves a widow with a son and three daughters.

MEDICAL NEWS

University of Oxford

Dr. A. G. Gibson, Nuffield reader in morbid anatomy, has been elected to a professorial fellowship at Merton College.

University of Wales

At recent examinations at the Welsh National School of Medicine, Cardiff, the following candidates were successful:

Medicine.—John Farr (with distinction), Gweneth Howell, W. R. L. James, J. T. Watkins, and H. O. C. Williams.
Pharmacology.—A. G. C. Cox, T. C. H. Davies, I. L. R. Evans (with distinction), Michael Grolman, Olwen Howell, D. H. Jenkins, Anne N. M. Llewhelin, Flora Macaulay, R. M. Marshall, Josephine Parnell, Mary G. Powell, and Cecil Thomas.
Surgery.—J. A. B. Thomas.

Royal College of Physicians of Edinburgh

At the annual meeting of the college on Dec. 2nd Dr. Alexander Goodall was elected president for the ensuing year. Dr. W. T. Ritchie, Dr. Edwin Bramwell, Dr. John D. Comrie, Prof. Charles McNeil, Dr. A. Fergus Hewat, and Dr. D. M. Lyon were elected members of council. The president nominated Dr. Comrie as vice-president. Dr. G. Lovell Gulland and Dr. R. B. Campbell were appointed representatives of the college on the board of managers of the Royal Infirmary, Edinburgh.

Flag Days for London Hospitals

At the combined flag days held this year in the City and the metropolitan police district for the London hospitals over £32,500 was collected. This is £7000 more than was obtained from the 56 individual collections held in 1936.

London (R.F.H.) School of Medicine for Women

Mrs. Kinnell presided at the annual dinner held at the Savoy Hotel, London, on Dec. 2nd, and herself proposed The School and Hospital in a speech admirable alike for its form and brevity. She referred with feeling to the retirement under the time limit of Miss Brooks whose lifelong dream of a trip round the world was now being realised, and congratulated the school on the qualities of her successor, Miss Nancy Moller, M.A. Among the events of the year must be mentioned an extra scholarship and an extra prize offered by the Clothworkers, whose benefit they already abundantly enjoyed. It was a dual toast she was proposing. The school and hospital filled so large a part of the lives of most of us, she said, that we had almost forgotten that they did not start life together. The liaison however had proved easy and satisfactory, subject to sundry little readjustments necessitated by disparity of fortune, for the hospital had no endowment. Nevertheless the office of the hospital was to teach and to set a standard of excellence to other hospitals.—Mr. P. Jenner Verrall proposed The Guests, who formed part of what he justly called an exceedingly pleasant and friendly gathering, and he explained with some care how he had himself surmounted the fearful dangers of meeting so many intellectual women.—Mr. David Low, in responding, said that at a medical gathering he had expected good wholesome food and the standards of conduct prescribed by the G.M.C.; "yet," he added, "I have not read my Cronin for nothing." He was however generously prepared to find among doctors, as among cartoonists, some who could still give unselfish service to humanity.—Miss Grace Hadow, M.A., also replied, and Dr. D. C. Staveley proposed The Chairman who, she said, was the first woman to preside at the weekly board of a teaching hospital.

Association of Scientific Workers

The show of science films announced for next Sunday has been postponed until Wednesday, Dec. 15th, at 8 P.M., at the Royal Institution, 21, Albemarle-street, London, W.

London School of Hygiene

A short course on industrial physiology and medical industrial psychology will be held at the school, Keppel-street, W.C., from Feb. 7th to 18th. It is designed primarily for members of the supervisory staff in industry but may be of interest to industrial medical officers. Further information may be had from the secretary of the school.

Bernhard Baron Trust

On Dec. 5th grants amounting to £43,000 were made from this trust to various hospitals and charities. The grants included £16,335 to London hospitals and £10,290 to hospitals outside London. Under the terms of the trust they are made every year on the late Mr. Baron's birthday. The gift of new laboratories to the Royal College of Surgeons of England is described on p. 1395.

Post-graduate Courses in Berlin

The following are the subjects of international medical post-graduate courses to be held in Berlin next year: constitutional pathology and clinical medicine (Feb. 21st to 26th); common mistakes in the diagnosis and treatment of internal diseases (Feb. 28th to March 5th); diet (March 7th to 12th); tuberculosis (March 14th to 19th); diseases of the ear, nose, and throat (Feb. 28th to March 12th); surgery (April 25th to 30th); ophthalmology (March 21st to 26th); ray therapy (May 2nd to 7th); homœopathy (April 25th to May 21st). These courses have been arranged by the Berliner Akademie für ärztliche Fortbildung, and further information may be had from the secretary, Robert Koch-Platz 7, Berlin, N.W.7.

The Thames Estuary and Sewage Disposal

In a Chadwick lecture given at the London School of Hygiene on Dec. 7th Lt.-Colonel W. Butler, M.B., spoke of the importance of the Thames estuary to the health of London. It was not merely the largest open space of the metropolis, but if unpolluted would, like the parks, renew the atmospheric oxygen. Pollution of the estuary, however, both above and below the sewage outfalls of the London County Council, was now very serious, and at times the whole of the dissolved oxygen in the waters of the estuary throughout the County of London was removed by sewage carried upstream through London by tidal resurgence. The sedimentation of the grosser solids of the sewage, carried out at Barking and Crossness, was now utterly inadequate. Colonel Butler urged the need for a barrage to prevent resurgence of the contaminated water. As to purification of the sewage, the L.C.C. had provided or had in hand work for treating about a fifth of the total volume, if its reception were limited to the waters below the barrage—a much simpler task. Purification of the still limited character at present aimed at in the new plant should be extended till the whole of the sewage of the main drainage of London was treated to that degree. The lecturer expressed his agreement with the recommendation of the Report on Greater London Drainage by Sir George Humphreys and Mr. Peirson Frank in 1935 that all arrangements for sewage disposal

in and around the metropolis should be coördinated and planned. The report also made proposals for the treatment of sewage in ten or fewer centralised disposal works distributed throughout Greater London, and sited with a view to possible ultimate conveyance of the sewage to Dungeness, there to be discharged into the sea together with the rest of London's sewage. Colonel Butler, on the other hand, contended that the whole of the sewage of Greater London should be brought as originally intended into the main drainage system of the metropolis which already dealt with about three-quarters of the total and that this sewage should all be conveyed to the lower estuary below the proposed barrage and, after adequate treatment, there discharged. A pure Thames above the barrage would thus be ensured, while the condition of the estuarial waters below it would be improved beyond comparison.

County Hospital, Farnborough

Kent County council is going to spend over £69,000 on extensions to this hospital.

Hospital Libraries

Queen Mary has consented to become patroness of the British Red Cross Society and Order of St. John hospital library. There are now about 2000 hospitals on the lists of the hospital library.

Hoxton Health Centre

A new school treatment centre was opened at Hoxton, near Shoreditch Church, on Nov. 30th. It has two rooms for dental treatment, a surgery, a waiting-room, a room for remedial exercises and sun-ray treatment, and a "shampoo" room where children will be taken to get rid of nits.

Medical Diary

December 13th to December 18th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY.
United Services. 4.30 P.M.
Major-General W. P. MacArthur: Some Unpublished Correspondence of William Fergusson, M.D. (1773–1847), Inspector-General of Military Hospitals. (Presidential address.)
TUESDAY.
Therapeutics and Pharmacology. 5 P.M.
Dr. J. W. Trevan: The Introduction of New Remedies into Clinical Practice. (Presidential address.)
Psychiatry. 8.30 P.M.
Dr. Mildred Creak: Psychoses in Children.
THURSDAY.
Dermatology. 5 P.M. (Cases at 4 P.M.)
Dr. F. Parkes Weber and Dr. W. Freudenthal: 1. Synovial lesion. Dr. Robert Klaber: 2. Recklinghausen's Disease with Glomoid Tumours.
Neurology. 8.30 P.M.
Dr. Oljenick (Amsterdam): Osmosis and Brain Pathology.
FRIDAY.
Physical Medicine. 4.30 P.M.
Dr. H. J. Gibson, Dr. L. C. Hill, Dr. D. H. Collins, and Dr. W. Yeoman: The Effects of Physical Treatment on the Arneth Count and Sedimentation-rate in Rheumatic Conditions.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY.—8.30 P.M., Mr. H. W. Rodgers, Dr. G. T. Calthorp, and Dr. S. Cochrane Shanks: Modern Methods of Investigating Gastric Diseases.

CHELSEA CLINICAL SOCIETY.
TUESDAY.—8.30 P.M. (Rembrandt Hotel, Thurloe-place, S.W.), Mr. Alan Shorter: Medicine and Surgery in Ancient Egypt.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.
WEDNESDAY.—9.15 P.M. (Royal Northern Hospital, N.), Dr. Margaret Lowenfeld: Some Contributions of Child Psychology to Problems of General Practice.

PADDINGTON MEDICAL SOCIETY.
TUESDAY.—9 P.M. (Paddington Tuberculosis Dispensary, Talbot-road, W.), Dr. H. L. Marriott: Treatment of Cases of Acute Poisoning.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.
FRIDAY.—5.30 P.M. (London School of Hygiene, Keppel-street, W.C.), Dr. J. J. Buchan and Dr. Donald Stewart: The Public Health Services and Industrial Hygiene. (Combined meeting with Society of Medical Officers of Health.)

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY.—8.15 P.M. (1, Wimpole-street, W.), Dr. K. de B. Codrington: The Meaning of Ritual.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
TUESDAY.—4.30 P.M., Dr. Hinds Howell: Syphilis of the Nervous System.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. T. C. Stamp: Diagnosis of Typhoidal Diseases. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. S. R. Gloyne: The Pathology of Tuberculosis.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. G. F. Gibberd: Toxæmias of Pregnancy.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. C. Naunton Morgan: Diseases of the Rectum.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E., afternoon course in skin diseases.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., afternoon course in neurology.—PRESTON HALL, near MAIDSTONE, Kent, Sat., demonstration on Tomography, and lecture-demonstration on the Surgical Treatment of Pulmonary Tuberculosis.—Courses are open only to members.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY.—4 P.M., Mr. W. G. Scott-Brown: The Common Cold.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street W.C.
THURSDAY.—2 P.M., Mr. T. Twistington Higgins: Congenital Abnormalities of the Urogenital Tract. 3 P.M., Dr. D. B. Bradshaw: Are Skin Tests of Value in Asthma?
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

ST. GEORGE'S HOSPITAL, S.W.
THURSDAY.—5 P.M., Dr. E. Guttmann: Cerebral Arteriosclerosis. (Psychiatric demonstration.)

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY.—4 P.M. (St. James' Hospital, Ouseley-road, S.W.), Dr. C. E. Lakin: Demonstration of Medical Cases.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Mr. Geoffrey Jefferson: Neuro-surgical Cases.

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Dr. J. R. H. Towers: Some Common Cardiac Conditions.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Western Infirmary), Prof. A. J. Ballantyne: Diseases and Abnormalities of the Eyelids.

Appointments

ALLEN, S. G., M.R.C.S. Eng., L.D.S., Hon. Assistant Dental Surgeon to the London Hospital.

BRADDOCK, DOROTHY M., M.B. Birm., Resident Anæsthetic Registrar at the Hospital for Sick Children, Great Ormond-street.

BRODRICK, J. M., M.R.C.S. Eng., Hon. Assistant Ophthalmic Surgeon to the Royal Albert Edward Infirmary and Dispensary, Wigan.

BRYSON, A. F., B.Chir. Camb., F.R.C.S. Eng., Resident Surgical Officer and Registrar at the Miller General Hospital, Greenwich.

BURNETT, J. S. G., M.B. Glasg., D.P.H., Medical Officer of Health for Chadderton Urban District.

GOWAR, E. J. S., M.B. Lond., F.R.C.S. Eng., Surgical Registrar at the Middlesex Hospital.

GRUNDY, ERNEST, M.D. (Hyg.) Lond., D.P.H., Medical Officer of Health for Southall.

LOUGHRIDGE, W. M., M.B. Belf., House Surgeon at the Hospital for Sick Children, Great Ormond-street.

MACKEITH, S. A., M.R.C.S. Eng., D.P.M., Hon. Psychiatrist to the Coventry and Warwickshire Hospital.

MURRAY, R. C., M.B. Camb., F.R.C.S. Eng., Resident Surgical Officer at Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry.

NAFTALIN, REUBEN, L.R.C.P. Edin., Resident Medical Officer at Hull Infectious Diseases Hospital.

OWEN, S. A., M.D. Camb., F.R.C.P. Lond., Consulting Physician for Medical Diseases of Children to the West London Hospital.

PEARSON, J. E. G., B.M. Oxon., M.R.C.P. Lond., Medical Registrar at the Middlesex Hospital.

STEVENS, H. E., M.B. Sydney, M.R.C.P. Lond., D.P.H., Medical Superintendent at the Berks and Bucks Joint Sanatorium Peppard.

TAIT, P. W., M.B. Edin., D.P.H., Assistant Tuberculosis Officer for Edinburgh.

TAYLOR, R. A. R., M.B. Glasg., Resident Surgical Officer at the Bolton Royal Infirmary.

Hospital for Women, Soho-square, London.—The following appointments are announced:—
NIXON, W. C. W., M.D. Lond., F.R.C.S. Eng., M.C.O.G., Surgeon in Charge of Out-patients (Gynæcological);
LANDER, F. P. LEE, M.D., M.R.C.P. Lond., Hon. Consulting Physician; and
SIMPSON, S. LEVY, M.D. Camb., M.R.C.P. Lond., Hon. Consulting Physician.

London County Council Hospital Staff.—The following appointments, promotions, and transfers are announced. A.M.O. (I) or (II) = Assistant Medical Officer, Grades I or II; D.M.O. = District Medical Officer; Temp. = Temporary.
WOODHEAD, ALICE, M.D. Manitoba, A.M.O. (I), St. Giles';
CAIRNS, D. R., M.B. Belf., A.M.O. (I), Lewisham;
EDWARDS, M. L., M.B. Sydney, A.M.O. (I), Queen Mary's, Carshalton;
HARDY, J. D., M.D. Belf., D.C.O.G., A.M.O. (I), Fulham;
WILTON, JACK, F.R.C.S. Edin., A.M.O. (I), Fulham;
TRETHOWAN, H. M., M.B. Aberd., A.M.O. (II), Queen Mary's, Sidcup;
FLETCHER-JONES, H. C., M.B. Lond., A.M.O. (II), St. Stephen's
EASON, T. J., M.B., F.R.C.S. Edin., A.M.O. (II), Heatherwood;
SANDFORD, IRENE E., M.B. Lond., A.M.O. (II), St. James';
MACDOUGALL, W. E., M.B. Durh., L.D.S. Glasg., A.M.O. (II), Lewisham;
SHARP, H. W. R., M.B. Sydney, A.M.O. (II), Lewisham;
HUNT, H. B., M.B. Birm., A.M.O. (II), St. Mary, Islington;
SMITH, MAUD I., M.B. Edin., A.M.O. (II), Hackney;
MILNER, A. N. P., M.B. Dubl., A.M.O. (II), Paddington;
BARBOUR, G. B., M.B. Camb., A.M.O. (II), Lambeth;
CORMICK, JANET F., M.B. Glasg., House Physician, Downs;
STEED, G. R., M.R.C.S. Eng., House Physician, St. Giles';
PRENDIVILLE, J. T., M.B. Dubl., House Surgeon, St. Mary Abbots;
DAVID, ALAN, M.R.C.S. Eng., House Physician, St. Andrew's;
FABER, G. R., M.A. Camb., M.R.C.S. Eng., House Surgeon, Paddington;
FEIWEL, MICHAEL, M.B. Camb., House Physician, St. James';
SHAW, RONALD, M.A. Camb., M.R.C.S. Eng., House Physician, St. James';
INGLIS, AUGUSTA S., M.B. Edin., Clinical Assistant, Fulham;
COLIN-RUSS, ERNEST, M.R.C.S. Eng., Temp. D.M.O. for part of Lower Holloway and part of Highbury;
LOUIS, FRANCIS, M.B. Lond., F.R.C.S. Eng., Temp. D.M.O. for East Fulham;
MELTON, GEORGE, M.D., M.R.C.P. Lond., Senior A.M.O. (II), Lewisham;
GREENFIELD, C. R. M., M.B. Lond., D.P.H., Senior A.M.O. (II), North-Eastern;
MACKEITH, R. C., B.M. Oxon., A.M.O. (I), St. James';
SAVAGE, O. A., M.R.C.P. Lond., A.M.O. (I), St. Stephen's;
LAWSON, W. S. G., M.B. Lond., A.M.O. (I), St. Nicholas'.

Certifying Surgeons under the Factory and Workshop Acts: Dr. E. L. MOMMEN (Denby Dale District, York, W.R.); Dr. T. C. OUTRED (Gravesend District, Kent); Dr. A. C. THOMSON (Kirton-in-Lindsey District, Lincoln).

Vacancies

For further information refer to the advertisement columns

Acton Hosp., W.—Cas. O., at rate of £150.
Birmingham City.—Asst. Res. M.O. in Tuber. Section of P.H. Dept., £450.
Birmingham City Mental Hosp.—Jun. Asst. M.O., £350.
Blackburn Royal Infirmary.—Res. Surg. O., £250.
Board of Control.—Commissioner, £850.
Bradford, Grassington Sanatorium.—Asst. M.O., £175.
Bradford Technical College.—Asst. Lecturer in Physiology, £186 to £480.
Bristol General Hosp.—Cas. H.S., at rate of £100. Also H.P.'s, H.S.'s, and Res. Obstet. O., each at rate of £80.
British Red Cross Society, Clinic for Rheumatism, Peto-place, Marylebone, N.W.—Hon. Asst. Laryngologist.
Burton-on-Trent General Infirmary.—H.P. and Cas. O., £150.
Canterbury, Kent and Canterbury Hosp.—H.S. to Spec. Depts., H.P., and H.S., each at rate of £125.
Cardiff, Welsh National School of Medicine.—Asst. Lecturer in Dept. of Materia Medica and Pharmacology, £500.
Chesterfield and North Derbyshire Royal Hosp.—H.S. to Ophth. and Ear, Nose, and Throat Depts., at rate of £150.
Chichester, Royal West Sussex Hosp.—Sen. and Jun. H.S.'s, £175 and £125 respectively.
Coventry and Warwickshire Hosp.—Res. Cas. O., at rate of £200.
Croydon General Hosp.—Second Cas. H.S., £200. Also Cas. H.S., £125.
Deal, Victoria Hosp.—Res. M.O., at rate of £150.
Dreadnought Hosp., Greenwich, S.E.—Receiving Room Officer, at rate of £100.
Durham County and Sunderland Eye Infirmary.—H.S., £350.
Durham, Richard Murray Hosp., Blackhill.—H.S., £200.
Ealing Borough.—Res. Asst. M.O., £350.
East Grinstead and Uckfield Rural Districts.—M.O.H., £800.
Eccles Borough.—Asst. M.O.H., £600.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Hon. Asst. Surgeon. Hon. Asst. Obstet. Surgeon. Also H.P., First, Second, and Third H.S.'s. and Obstet. Surgeon, each at rate of £50.
General Post Office, Headquarters Medical Branch.—Asst. M.O., £500.
Gordon Hosp. for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. Surg. O., at rate of £150.
Grimsby Corporation Hosp.—Asst. M.O.H., £500.
Guy's Hosp., S.E.—Res. Anæsthetist, at rate of £125.
Hammersmith Metropolitan Borough.—Asst. M.O., £500.
Hellingley, East Sussex County Mental Hosp.—Jun. Asst. Res. M.O., £350.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. Surgeon to Throat and Ear Dept.
Hosp. for Sick Children, Great Ormond-street, W.C.—Asst. Pathologist, £400.
Hounslow Hosp.—Cas. O., £100.
Huddersfield Royal Infirmary.—H.S., at rate of £150.
Ilford, King George Hosp.—H.S., at rate of £100.
Indian Government.—Six Appts. for Med. Research Dept., each Rs. 625 per month.
Infants Hosp., Vincent-square, Westminster.—Hon. Radiologist.
King Edward Memorial Hosp., Ealing, W.—Second Cons. Laryngologist.
Lancaster County Mental Hosp.—Two Asst. M.O.'s, each £500.
L.C.C.—Organiser of School Meals, £360. Asst. M.O.'s, Grade I, each £350. Also Asst. M.O.'s, Grade II, each £250.
Lincoln County Hosp.—Jun. H.S., £150–£200.
Lingfield Epileptic Colony.—Asst. M.O., £300.
Liverpool, County Mental Hosp., Rainhill.—Second Asst. M.O., £650.
London University.—University Chair of Medicine at St. Bartholomew's Hospital Medical College, £2000.
Manchester City.—City Coroner, £1200.
Manchester, Monsall Hosp. for Infectious Diseases.—Jun. Res. Asst. M.O., £250.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Manchester, St. Mary's Hosps.—H.S.'s, each at rate of £50.
Middlesex County Hosp., Bushey.—Res. Asst. M.O., £400.
Miller General Hosp., Greenwich-road, S.E.—Hon. Asst. Ophth. Surgeon. Also Hon. Asst. Physician.
National Hosp., Queen-square, W.C.—H.S., £100.
Newcastle, Royal Victoria Infirmary.—Hon. Asst. Surgeon.
Northampton General Hosp.—Hon. Surgeon.
Norwich, Norfolk and Norwich Hosp.—Cas. O., £120.
Peterborough and District Memorial Hosp.—Pathologist, £500.
Pontefract General Infirmary.—Second Res. M.O., at rate of £150.
Preston and County of Lancaster Royal Infirmary.—Res. Anæsthetist, £200–£300.
Putney Hosp., Lower Common, S.W.—Res. M.O., £150.
Rhondda Urban District Council.—Temp. Asst. M.O., at rate of £500.
Rotherham C.B.—Asst. M.O.'s, each £600.
Royal Cancer Hosp., Fulham-road, S.W.—H.S. to Radium Dept.
Royal Masonic Hosp., Ravenscourt Park, W.—Res. M.O., £300.
St. Albans, Hill End Hosp. and Clinic, &c.—H.P., at rate of £165.
St. Mary's Hosp. for Women and Children, Plaistow, E.—Hon. Ophth. Surgeon.
St. Peter's Hosp. for Stone, Henrietta-street, W.C.—Clin. Assts. to Hon. Staff.
Shrewsbury, Royal Salop Infirmary.—Res. H.S., at rate of £160.
Southampton, Isolation Hosp. and Sanatorium.—Jun. Res. M.O., £200.
Southend-on-Sea General Hosp.—Res. Anæsthetist, at rate of £125.
University College Hosp., Gower-street, W.C.—Ophth. Registrar, £100. Also Part-time Hon. Clin. Asst. in X Ray Therapy Dept.
Wakefield, West Riding Mental Hosp.—Two Ungraded M.O.'s, each £350.
West London Hosp., Hammersmith-road, W.—Res. Med. Reg., £250. Physician for Medical Diseases of Children. Hon. Ophth. Surg. Also Med. Reg. to Children's Dept., £100.
Willesden General Hosp., Harlesden-road, N.W.—Cas. O., at rate of £100. Med. Reg., at rate of £50. Hon. Clin. Assts. to Out-patient Dept. Also Sister in Charge of Massage and Electric Therapeutic Dept., £120.
Windsor, King Edward VII Hosp.—Two H.S.'s and Cas. O., each at rate of £100.
Wolverhampton and Midland Counties Eye Infirmary.—H.S., £150.
Wolverhampton Royal Hosp.—H.S., and H.S. for Orthopædic and Fracture Dept., each at rate of £100.
Wrexham and East Denbighshire War Memorial Hosp.—Res. H.S. to Spec. Depts., at rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Solihull (Warwickshire), Tilbury (Essex), Tutbury (Staffordshire), Appleby (Westmorland), New Mills (Derbyshire), and Ulceby (Lincolnshire).

Births, Marriages, and Deaths

BIRTHS

CAMPBELL.—On Dec. 1st, at Nuffield House, Guy's Hospital, the wife of Dr. Maurice Campbell, of Hampstead—a son.
CHEVERTON.—On Dec. 7th, at Belize, the wife of Dr. R. L. Cheverton, Senior Medical Officer, British Honduras—a daughter.
GALLAGHER.—On Dec. 2nd, at Jersey, the wife of Dr. J. F. P. Gallagher—a son.
MAIN.—On Nov. 28th, at Newcastle-on-Tyne, the wife of Dr. T. F. Main—a daughter.
NICHOLSON.—On Nov. 30th, at Hong-Kong, the wife of Surg. Lt.-Commdr. C. B. Nicholson—a son.
SHACKLETON-BAILEY.—On Dec. 5th, at Norwich, the wife of Dr. J. Shackleton Bailey, of Eye, Suffolk—a son.

MARRIAGES

REAVELL—SWINBURNE.—On Dec. 4th, at St. Andrew's, Totteridge, Denys Clowes Reavell, M.D., B.S., to Doris Margaret, eldest daughter of Mr. and Mrs. F. R. Swinburne, of Wylde Green, Warwickshire.

DEATHS

PASSMORE.—On Dec. 4th, George Shapland Passmore, L.R.C.P.I., L.S.A., of Clevedon, aged 77.
PRIESTLEY.—On Nov. 30th, at High Wycombe, Bucks, Robert Chambers Priestley, O.B.E., M.B. Camb., J.P., in his 81st year.
PURVES.—On Dec. 4th, Robert Black Purves, D.S.O., M.B., F.R.C.S. Edin., of Lincoln.
WAITHMAN.—On Dec. 2nd, James C. Waithman, M.D. Camb., New Cavendish-street, W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

DEGENERATION IN THE BUSHVELD

IT is not every medical inspector of schools who can bring to his work the energy, enthusiasm, and enduring optimism of Dr. Leipoldt. His account[1] of medical adventure in the Bushveld of the Transvaal and of his fight against disease and superstition among the white settlers there makes good reading. Having examined some 150,000 boys and girls, he can speak with authority on the medical problems of that physically beautiful country where, in his considered view, ten generations of Nordic-born settlers have not yet produced a type adapted to an environment which includes "heat, drought, isolation, and humidity." Eighty-five per cent. of 1000 Bushveld children born of white parents and grandparents showed degenerative defects. It is true that the first, and sometimes the second, generation show physical improvement, but, after that, deterioration begins which can only be stayed by an influx of fresh Nordic blood. Chronic malaria is the curse of the Bushveld; nearly 50 per cent. of children suffer from this or from redwater (bilharziasis) and 90 per cent. are definitely undernourished. This malnutrition is due to a quite unnecessarily unbalanced diet consisting largely of mealie meal. In one settlement, fresh fruit and vegetables are scarce although the soil is not poor and there is no stint of water. Milk and fresh meat also are scarce, wheaten bread is not a staple article of diet, and fresh butter is a comparative rarity. Close by runs a river teeming with fish, yet fish is hardly ever eaten. No wonder the children are listless and disinclined to exert themselves—either at work or play. The school curriculum also invites criticism; a five-hour session daily devoted to "the three R's, a little bilingualism, and a good deal of formal religious instruction" sounds sufficiently uninspiring, and the reason why some of the boys chew tobacco may not be solely to stave off the pangs of hunger, as Dr. Leipoldt suggests, but also as an antidote to boredom. In contrast to the generally poor standard of physique found among the children, Dr. Leipoldt once met with a twin boy and girl, aged nine, neither of whom showed any physical defect whatsoever. Their great-grandparents had been brother and sister who had married incestuously, their grandparents were cousins and their parents second cousins, suggesting that, given a sound stock, endogamy is not necessarily harmful. The author writes interestingly and sympathetically of Kruger, whom he had met, and of many other matters both para-medical and non-medical. Especially attractive are the chapters on the natural history of the country written by one who is obviously a born naturalist, since the mamba holds no terrors for him and he thinks nothing of sharing a bedroom with a nest of tarantulas. The reader ignorant of the Bushveld may hesitate to pick up this book; but, having picked it up, he will certainly have difficulty in putting it down.

MEDICINE IN PARAMATTA

IT is almost a century and a half ago that the first buildings were erected on the site of Paramatta; for in 1789 the urgent necessity of providing food for the settlement at Port Jackson induced Governor Phillip to organise an agricultural department which should provide for the needs of the establishment for which he was responsible. He built quarters for the convicts, a small residence for himself, and a large structure called the Hospital to accommodate two hundred inmates. Naturally such an enterprise required the services of a surgeon in charge, and Thomas Arndell, a naval surgeon, was the first holder of the office, to be succeeded by a long line of official medical men for forty years till in 1829 the growing population of the township required and could support a practitioner wholly independent of the official appointment. It is an interesting story of slow development that Mr. K. M. Brown has been able to gather together,[1] illuminated by anecdotes and local traditions, by the inevitable disputes of a small community and the enviable enterprise of the earlier years. He passes in review all the outstanding medical names of his beloved town, many of them men of courage and ability beyond the average. He himself was born and lives in a house which was built more than a century ago by an ex-convict who must have been a man of extraordinary ingenuity and perseverance, though unhappily nearly always in defiance or evasion of constituted authority. The book is illustrated with interesting photographs and drawings of places and people and is a worthy contribution to the history of the author's birthplace.

[1] Bushveld Doctor. By C. Louis Leipoldt. London: Jonathan Cape. 1937. Pp. 350. 10*s.* 6*d.*

WOMEN GYMNASTS AS MOTHERS

IN the course of a discussion following a demonstration of physical education given to members of the medical profession in Birmingham on Nov. 19th, Dr. D. J. Nicol asked whether it had been noted that the women who produced the best babies with the least effort were often those who appeared to be the least athletic, his contention being that over-development of muscle in the athletic girl tended to make labour difficult. Dr. Arthur Beauchamp said that he was aware that this opinion had been held and was still quoted in text-books, but that he did not think it was true. Mrs. Adair Impey, president of the Birmingham Trained Gymnasts Club, said that as the result of an extensive inquiry made among gymnast teachers, past students of physical training colleges, it had been found that gymnasts did not have longer or more difficult labour than other women and that miscarriages were rare among them. We are informed that another inquiry on similar lines is to be made by the Medical Women's Federation in conjunction with the Ling Physical Education Association.

COUPONS FOR A MEDICAL CHARITY

Dr. HENRY ROBINSON, chairman of the Sherman Bigg Fund, writes from 49, Bedford-square, London, W.C. 1: "Your readers may be aware that two daily illustrated papers—the *Daily Sketch* and the *Daily Mirror*—are printing in every issue a coupon which entitles any approved charity to collect from the proprietors of those papers a fraction of a penny for each one presented. There must be thousands of medical households in which these popular papers are taken in. In some of these households, I expect, the coupons are already being collected on behalf of some charity or another. This letter is to inform your readers that the Sherman Bigg Fund, administered from these offices, has been approved in respect of this scheme; and to ask every doctor to get some junior member of his household to cut out the coupons and send them here. The Bigg Fund, I ought to say, is available for the relief of any sort of distress, and is mainly used for educational grants to medical orphans, both boys and girls, for whom the ordinary scholarships of the Royal Medical Foundation are not available or are unsuitable, by reason of age and other causes."

[1] Medical Practice in Old Paramatta. By Keith Macarthur Brown. Sydney and London: Angus and Robertson. 1937. Pp. 136. 12*s.* 6*d.*

WAR MEMORIAL HOSPITAL, PETERBOROUGH.—Since 1885, when the Peterborough and District workpeople's hospital fund was started, it has raised £51,000 for the old infirmary and the present War Memorial Hospital which replaced it. The fund's latest gift is a new X ray power unit. In 1887 subscriptions to the fund amounted to £325; in 1936 they were £2768.